

# Cofrin Center for Biodiversity

Annual Report 2020-2021

## Background

The Cofrin Center for Biodiversity (CCB) was established in 1999 to consolidate several successful University of Wisconsin-Green Bay (UWGB) activities associated with natural history, field biology, and biological conservation. Today, the CCB is affiliated with the Department of Natural and Applied Sciences in the College of Science, Engineering, and Technology (CSET). Elements of the program include 1) **five natural areas**, including the Cofrin Memorial Arboretum on the UWGB campus, 2) the **Richter Museum of Natural History**, 3) the **Gary A. Fewless Herbarium**, and 4) an array of **educational opportunities for UWGB undergraduate and graduate students**, including graduate assistantships, student research grants, conservation-related work experiences, and maintenance of outdoor laboratories. These opportunities have become integral features of the UWGB academic curriculum and have established a strong track record of guiding students toward successful professional careers. The CCB also partners with other academic researchers, government agencies, non-profit conservation organizations, private companies, K-12 educators, and community scientists to promote awareness and conservation of the western Great Lakes flora and fauna. CCB operations are overseen by a nine-member Faculty-Staff Advisory Committee (Table 1) appointed by the CSET Dean.

## Summary of Activities

CCB operating expenses during the 2020-2021 fiscal year totaled \$381,179 (Table 2), excluding expenditures from 9 active external research grants (Table 3) and faculty funding of the director and curators (Table 4). In addition to annual gifts from The 1923 Fund and interest income from endowments, the Center, in collaboration with faculty partners Dr. Amy Wolf and Dr. Karen Stahlheber, obtained 4 major external grants during the 2020-21 fiscal year, totaling \$429,274. These dollars comprised **24.4% of the total external research funding obtained by faculty and staff in the College of Science and Technology**, the largest grant-generating college within the university. We received an additional \$304,000 in gifts and endowment interest for CCB operations supplemented by over \$150,000 in private donations for the Cofrin Memorial Arboretum bridge replacement project. Our external grants (not including private gifts) represented 8.5% of the total support for research and sponsored programs in the entire university. Public funding sources for new and continuing grants during 2020-21 included UW Sea Grant, the US Fish and Wildlife Service, Fox River Trustee Council (NRDA), US Environmental Protection Agency, Wisconsin Department of Natural Resources, Wisconsin Coastal Management Program (NOAA), and the National Fish and Wildlife Foundation.

Like so much of the UW-Green Bay community, the CCB was affected by the Covid-19 pandemic during the 2020-21 fiscal year. Nevertheless, we continued to provide substantial contributions to nature conservation, scientific research, the UW-Green Bay educational program, and outdoor recreation for people in northeastern Wisconsin. **The program employed 32 students as project assistants or student researchers** (Table 5). Supported student projects ranged from acoustic surveys of bat populations to development of a children's book on the Great Lakes. Students funded by the CCB during 2020-21 were mentored by 10 UW-Green Bay faculty members and 4 academic staff specialists, including partnering faculty or staff from 6 academic disciplines.

**Two new full-time and two part-time staff members** were added to the CCB team during 2020-21. Dr. Keir Wefferling joined UW-Green Bay as Curator of the Gary Fewless Herbarium in August 2020. Keir received his PhD from the University of Wisconsin-Milwaukee and recently finished a postdoctoral appointment at the University of California's Jepson Herbarium, where he studied the evolution and biogeography of polyploid ferns. Andrew LaPlant started in April 2021 as the Arboretum Project Coordinator, whose responsibilities include on-the-ground management activities at UW-Green Bay's 5 natural areas. A UW-Green Bay graduate, Andrew brings 10 years of experience as a conservation biologist and restoration ecologist, most recently at the environmental consulting company, NES Ecological Services. Jacob Depas, Director of Development for University Advancement, will be devoting half time to fundraising efforts for CCB projects, especially management and development of the Cofrin Memorial Arboretum. Like Andrew, Jacob is a graduate of UW-Green Bay. Samantha Betancur comes to UW-Green Bay from the North Carolina Aquarium at Pine Knoll Shores, where she was Outreach Coordinator for 11 years. Samantha received her Bachelor's degree from Carroll University in Wisconsin, and her Master's from Miami University in Ohio. Her position as Camps and Outreach Coordinator at UW-Green Bay will include outreach projects with the CCB.

Despite limitations imposed by the pandemic, CCB staff and partners achieved many significant milestones during 2020-21. Highlights include:

- Ecological restoration at the Wequiock Creek Natural Area began in earnest during 2020-2021. We (in collaboration with UWGB faculty members Dr. Amy Wolf and Dr. Karen Stahlheber and the [Northeast Wisconsin Land Trust](#)) received two major grants, one from [Fox River Natural Resource Trustee Council \(NRDA\)](#) and the second from the [US Fish and Wildlife Service Coastal Program](#). The NRDA grant will be used to manage invasive species and restore native shrubs and understory plants in the floodplain, while the second will be used to restore shallow wetlands and establish Midwest oak savanna in 36 acres of uplands adjacent to the riparian corridor. The US Fish and Wildlife Service, led by biologist Gary VanVreede, contributed critical expertise and funding for the wetland restoration component of this project.
- The Wequiock Creek project also has cultivated a growing collaboration with the UW-Green Bay [First Nations Studies](#) program, local tribal leaders, and the UW Sea Grant Program's Green Bay office, led by Julia Noordyk. CCB funding supported research

during summer 2021 by Stephanie Dodge, the First Nations program's first PhD student, mentored by Dr. J.P. Leary. The Wequiock project has great potential for developing educational awareness of this area's cultural heritage. We also are working with Dr. David Overstreet and the Office of the State Archaeologist to ensure compliance of restoration efforts and to develop an effective plan for education and outreach at the site.

- Under the leadership of Bobbie Webster and academic staff partners Paul Baumgart and Lynn Terrien, the ambitious East Shore Watershed Plan was completed and submitted to the Wisconsin Department of Natural Resources for review. Revisions are being completed during October 2021, and the final version will be sent to the US Environmental Protection Agency during fall 2021.
- Wolf and Howe, in collaboration with Giese, graduate students Jacob Woulf and Brandon Byrne, and a host of partners from the US Fish and Wildlife Service, Wisconsin DNR, and USDA Wildlife Services initiated a [UW Sea Grant funded study of piscivorous \(fish-eating\) birds in lower Green Bay](#) during early summer 2021. The first year of this research was highly successful, thanks significantly to expert help from Dr. Brian Dorr from Mississippi State University, who is now a full partner on the project. A "spinoff" of this project, we also are working with private companies [Cellcom](#), [Aexonis](#), and [Miromico](#) on developing an inexpensive bird tracking system using [LoRaWAN](#) technology.
- Webster, LaPlant, and student assistants have successfully restored native sedge meadow in a 10-acre parcel along Wequiock Creek within the Point au Sable Nature Reserve. Funding was provided by a grant from the US Fish and Wildlife Service and Wisconsin DNR associated with the Wequiock Creek Natural Area acquisition.
- A Great Lakes Restoration Initiative grant in collaboration with Door County Soil and Water has supported invasive species management at the Toft Point Natural Area by the CCB natural areas field crew and NES Ecological Services during 2021.
- Planning for replacement of 3 bridges in the Cofrin Arboretum was completed during summer 2021, funded by generous gifts from The 1923 Fund and the [David L. and Rita E. Nelson Family Fund](#). Construction is scheduled for late fall 2021, with a planned completion date in March 2022.
- The administrative structure of the Friends of Toft Point has undergone a change to align the organization's work more closely with the University. UWGB Foundation President Tony Werner, Chancellor Alexander, and the Chancellor's Chief of Staff Ben Joniaux have worked with Jim Cauley, Nick Anderson, Charlotte Lukes, and the FOTP Board to design a formal agreement to continue the excellent contributions of this Friends group, providing a model for other local groups associated with UWGB natural areas.
- Graduate intern Andrew Bowker has worked with CCB staff on developing a plan to create a UW System field station at the UWGB Kingfisher Farm property. Meetings are continuing with partners from UW- Milwaukee and the UW System's [Freshwater Collaborative of Wisconsin](#).
- Herbarium Curator Keir Wefferling attended a 6-week course for developing strategic plans for biodiversity collections. He, Richter Museum Curator Dan Meinhardt, and Erin

Giese developed a draft plan for engaging faculty and others in management of the CCB collections.

- Howe, Giese, Wefferling, and Dean Katers submitted a successful proposal to the Microsoft Azure Compute Grant program: “Delivering Regional Biodiversity Resources through Microsoft Azure”. The grant will provide software credits to develop cloud-based storage and infrastructure for CCB biodiversity data, and, in collaboration with Iftekhar Anam (Computer Science), Wefferling is applying machine learning to herbarium data exploration.
- Richter Museum Curator Dan Meinhardt supervised several internships and Master’s degree projects involving the collections. Michael Pietraszek developed educational “kits” on natural history for K-12 educators; Tiffany Paalman completed an undergraduate design internship on museum exhibits and displays, including a display on pollinators for the new UWGB/Brown County STEM Innovation Center; and Nicholas Reed started a Master’s internship on the Richter Museum fish collections.
- CCB resources continue to be an important part of the UW-Green Bay curriculum. Richter Museum and Fewless Herbarium collections are used extensively by not only Biology Department courses, but also by courses in art and design. The Cofrin Arboretum and Point au Sable Natural Area are important “outdoor laboratories” for courses in biology, environmental sciences, art, and even poetry.
- Erin Giese serves on the UW-Green Bay Council on Inclusivity, Diversity, and Equity, and Bobbie Webster was member of the Martin Luther King Day celebration committee. CCB staff have shown a commitment to recruiting and hiring practices that promote opportunities for underrepresented groups and cultivate a welcoming environment for all people.
- CCB staff participated in a workshop with web developer Lolar Moua of the UWGB Information Technology Department to learn skills for updating the CCB web pages. Transition of web pages to the new campus platform is underway.
- We have partnered with the [Western Great Lakes Bird and Bat Observatory](#) and web designer Jennifer Davis to revise and modernize the [Birder Certification Online](#) web site. This unique resource is used widely to train field observers and to provide validation of bird identification skills for participants in field research projects.
- EPA funding for the [Great Lakes Coastal Wetland Monitoring Program](#) has been renewed for five years (2021-2025). The CCB (through Giese and Howe) has been a leader in the bird and anuran (frogs/toads) component of this collaborative project since its beginning in 2011, along with scientists from 16 other universities and agencies.
- Howe and Giese contributed significantly to two chapters on bioindicators for the upcoming revision of the bi-national [State of the Great Lakes](#) report, scheduled for release in 2022.
- CCB staff have contributed their time to numerous community organizations and outreach activities. Among the most visible of these commitments, Erin Giese was elected to the prestigious [Board of Directors of the National Audubon Society](#). Bobbie Webster serves on the [Land and Water Conservation Board](#) of the Wisconsin Department of Agriculture, Trade, and Consumer Protection.

- Curator Dan Meinhardt hosted numerous tours of the Richter Museum for educational and community groups. He also presented public education talks to UW-Green Bay's Lifelong Learning Program, the Bay Area Bird Club, and other organizations and groups.
- Erin Giese has cultivated a growing collaboration between the Oneida Nation, Northeastern Wisconsin Audubon Society, and UWGB's student Audubon chapter. Giese and UWGB students have formed a team to monitor birds in this highly successful [grassland/wetland restoration](#) project on the Oneida Nation west of Green Bay.
- CCB researchers (including students) and UWGB Biology Professor Amy Wolf continued to study the federally endangered Piping Plover at the Cat Island Restoration Site in lower Green Bay, with funding from the US Fish and Wildlife Service. CCB graduate assistant Demetri Lafkas will be completing his Master's thesis on the Cat Island population during fall 2021.

## **Budget**

The Cofrin Center for Biodiversity operating budget (Table 2) continued to yield a deficit at the end of the fiscal year, in spite of the new funding reallocated from The 1923 Fund. Much of this deficit was due to salaries of discontinued staff positions during late summer 2020 and delays in grant-funded salaries and expenses during early 2021. These unanticipated expenses will disappear in the current fiscal year, and grant funding will make up much of this structural deficit. Our new budget model is now fully in effect during 2021-2022, creating sustainable operations through December 2023. Beginning in 2024, new sources of funding will be needed for the Arboretum Project Coordinator position and approximately \$54,000 in general operating expenses.

## **Acknowledgments**

The CCB staff are extremely grateful for support from many partners, beginning with the generous financial support from The 1923/1883 Funds and the family of Dr. David A. and Mary Ann Cofrin. We thank the Board of Advisors of The 1923 Fund and the Chief Advisor Steve Dhein, who has maintained a close connection with operations of the Center since its beginning. We also thank and acknowledge strong support and collaboration from the UWGB administration, faculty, and staff, especially: Chancellor Michael Alexander and his staff, including Ben Joniaux, Government and External Relations Director; Provost Kate Burns and her staff, particularly Pieter deHart and Holly Keener; CSET Dean Dr. John Katers, and NAS Chair Dr. Michael Draney, in addition to colleagues in the Offices of Facilities Management, University Advancement, Grants and Research, Controller/Business and Finance, Housekeeping, Human Resources, International Education, Information Technology, University Police, Multi-Ethnic Student Affairs, Pride Center, University Archives, Dining Services, Financial Aid, the Environmental Management and Business Institute, and UW Extension. We are particularly grateful for the valuable contributions by Tony Werner, Jacob Depas, and Nora Langolf (University Advancement); Paul Pinkston, Brad Gajeski, and Jeffrey Schulz (Facilities Management); Roger Wareham, Jeff Selner, Kristen Kearns, and Terri Fredenberg-Holzman

(Grants and Research); Monika Pynaker and Lolar Moua (Information Technology); Sue Bodilly, Tammy Papineau, Janet Bonkowski, Daniel Moore and Kimberly Vlies (Marketing and University Communications); Amy Ibuaka, Dr. Michael Zorn, and Dr. Amanda Nelson (CSET); Jenny Zeitler, Jane Lauren, Joe Schoenebeck, and Taylor Hilgart (NAS); members of the CCB Faculty-Staff Advisory Committee (Table 1); Kim McKeefry and Dr. Vicki Medland; and UWGB faculty collaborators, especially Dr. Amy Wolf, Dr. Karen Stahlheber, Dr. Lisa Grubisha, and Paul Baumgart. We also are very grateful for support from many partners in government agencies and conservation organizations, including Julia Noordyk (UW Sea Grant); Amy Carrozzino-Lyon (Green Bay Wild Rice Restoration Coordinator); Lynn Terrien (Lower Fox River Watershed Monitoring Program), Gary VanVreede, Betsy Galbraith, Reena Bowman, Trina Soyk, and Andrew Stevens (US Fish and Wildlife Service); Brianna Kupsky, Joshua Martinez, Andrew Hudak, and other Wisconsin DNR staff; Julie Hawkins-Tyriver and Deborah Nett (Northeast Wisconsin Land Trust); Mike Grimm, Kari Hagenow, and Nicole Van Helden (The Nature Conservancy); Dave Cerny (Town of Scott); Mike Mushinski, Whitney Prestby, and Brent Peterson (Brown County); Samantha Koyen, Door County Soil and Water; and Todd Breiby (Wisconsin Coastal Management Program). Finally, we are particularly grateful for the dedicated contributions to natural areas management by The Friends of Toft Point, especially Charlotte Lukes, Nick Anderson, James Cauley, and Mitch Levitt.

**Table 1. Faculty-Staff Advisory Committee**

Name	Start Term	End Term	Representing
Paul Pinkston ( <i>ex officio</i> )	-	-	Facilities Management
Michael Draney ( <i>ex officio</i> )	-	-	NAS
Karen Stahlheber (Chair)	2020	2023	ES&P
Jeff Benzow	2018	2021	At-large
Patrick Forsythe	2018	2021	NAS
Dan Moore	2019	2021	At-large
David Helpap	2020	2023	At-Large
Amy Wolf	2020	2023	ES&P
Richard Hein/Rebecca Abler	2020	2023	Other campuses

**Table 2. General Operating Budget – CCB accounts**

Source	Expenditures	Income	Source
Cofrin Arboretum (K756)	\$69,404	\$24,000	Cofrin Endowment interest
General Operations (DE11)	\$108,000	\$234,000	Annual 1923/1883 Fund gift
CCB Research (PRJ48RT)	\$203,775	\$70,000	1923 Fund re-allocation (salaries)
Point au Sable (CS11)	\$0.00	\$4,118	Pt. Sable Endowment interest
<b>Total</b>	<b>\$381,179</b>	<b>\$332,118</b>	

**Table 3. Budget – external grants**

Grant Account	Expenditures	Notes
Gr. Lakes Coastal Wetland Monitoring Program (144-AAA9693)	\$22,755	EPA/GLRI
East Shore Watershed Planning (w/Wolf) (144-AAG8935)	\$5,918	NOAA/WCMP
Ecology & Demography of Piping Plover (144-AAD7286)	\$26,546	USFWS
Monitoring of Piping Plovers at the Cat Island Restoration Site (w/Wolf) (144-AAJ1922)	\$5,451	USFWS
Nesting and Foraging Habitat Use of the Endangered Piping Plover (w/Wolf) (144-AAH7383)	\$8,803	USFWS
Door County Invasive Species Management Co-op Grant (with Door County Soil and Water) (144-AAI2355)	\$2,973	National Fish and Wildlife Foundation
Wetland restoration and floodplain habitat improvement at the newly-acquired Wequiock Creek Natural Area along lower Green Bay (w/Wolf, Stahlheber) (144-AAI9432)	\$14,952	Fox River Trustee Council (NRDA)
The Ecological Impact of Piscivorous Birds in the Lower Green Bay Ecosystem (w/Wolf) (144-AAI8816)	\$26,704	UW Sea Grant
Lower East Green Bay (Point au Sable/Wequiock): Habitat Restoration Sub-award (144-AAI2354)	\$2,983	Wisconsin DNR
<b>Total</b>	<b>\$117,085</b>	

**Table 4. Program Support – College of Science, Engineering and Technology**

Robert Howe, CCB Director (9 month appointment, 71% FTE)  
 Daniel Meinhardt, Richter Museum Curator (9 month appointment, 50% FTE + 1 month summer)  
 Keir Wefferling, Fewless Herbarium Curator (9 month appointment, 50% FTE + 1 month summer)

**Table 5. Student Employees and Grant Recipients (32)**

<b>Name</b>	<b>Project(s)</b>
Marc Aguirre	UWGB Natural Areas, Wequiock Creek, Pt. au Sable
Bethalynn Bontrager	Richter Museum
Andrew Bowker	UWGB Natural Areas, Kingfisher Farm
Nicholas Boulanger	East Shore Watershed Planning, Cofrin Research Grant
Patrick Brodhagen	UWGB Natural Areas
Brandon Byrne	Great Lakes Coastal Wetland Monitoring, Piping Plover, Green Bay AOC
Max Chung	Cofrin Research Grant
Jessica Cook	Cofrin Research Grant
Stephanie Dodge	Wequiock Creek
Britney Hirsch	Great Lakes Coastal Wetland Monitoring, Cofrin Arboretum
Tamara Kancoglu	UWGB Natural Areas, Wequiock Creek, Pt. au Sable, Cofrin Research
Nathan Knutson	Cofrin Research Grant
Christopher Koch	Richter Museum
Alicia Krause	Cofrin Research Grant
Demetri Lafkas	Great Lakes Coastal Wetland Monitoring, Piping Plover
Collette LaRue	Cofrin Research Grant
Mari Mitchell	Richter Museum, Cofrin Research Grant
Brenna Nicholson	Great Lakes Coastal Wetland Monitoring, Sea Grant Piscivorous Birds
Hunter Papham	Cofrin Research Grant, Toft Point Research
Tiffany Paalman	Richter Museum
Jacob Pelegrin	Cofrin Research Grant
Dustin Sablich	UWGB Natural Areas, Wequiock Creek, Pt. au Sable, Cofrin Research Grant
Olivia Salm	East Shore Watershed Planning, Cofrin Research Grant, UWGB Natural Areas
Joshua Schultz	Richter Museum
Nathan Schwartz	Great Lakes Coastal Wetland Monitoring, UWGB Natural Areas
Jarod Siekman-VerBoort	East Shore Watershed Planning, Cofrin Research Grant, Fewless Herbarium
Jacob Smither	Great Lakes Coastal Wetland Monitoring, Cofrin Arboretum
Max Stafford	Sea Grant Piscivorous Birds, Piping Plover
Katie Stephenson	Cofrin Center for Biodiversity Exhibits and Displays
Norah Swenson	Cofrin Research Grant
Malynn Tarczewski	Richter Museum
Jacob Woulf	Great Lakes Coastal Wetland Monitoring, Piping Plover, Richter Museum



**Table 6. Cofrin Center for Biodiversity Staff (2020-2021)**

Name	Position
Robert Howe	Director
Erin Giese	Senior Research Specialist
Bobbie Webster	Natural Areas Ecologist
Dan Meinhardt	Curator, Richter Museum of Natural History
Keir Wefferling	Curator, Gary A. Fewless Herbarium
Jacob Depas (shared with UWGB Advancement)	Director of Development
Samantha Betancur (shared with CSET Dean)	Outreach Coordinator
Andrew LaPlant	Cofrin Arboretum Project Coordinator
Jacob Woulf	Graduate Assistant
Brandon Byrne	Graduate Assistant

**Table 7. Publications and Major Reports (CCB/UWGB authors in bold)**

1. Wiegand, T., X. Wang, K.J. Anderson-Teixeira, N.A. Bourg, M. Cao, X. Ci, S.J. Davies, Z. Hao, **R.W. Howe**, W.J. Kress, J. Lian, J. Li, L. Lin, Y. Lin, K. Ma, W. McShea, X. Mi, S-H. Su, I-F. Sun, **A. Wolf**, W. Ye, and A. Huth. 2021. Consequences of spatial patterns for coexistence in species-rich plant communities. **Nature Ecology and Evolution** 5:965-973.  
<https://www.nature.com/articles/s41559-021-01440-0>

2. **Hohman, T.R., R.W. Howe**, D.C. Tozer, **E.E. Gnass Giese**, **A.T. Wolf**, G.J. Niemi, T.M. Gehring, G.P. Grabas, and C.J. Norment. 2021. Influence of lake levels on water extent, interspersion, and marsh birds in Great Lakes coastal wetlands. **Journal of Great Lakes Research** 47:534-545.  
<https://www.sciencedirect.com/science/article/abs/pii/S0380133021000228>

3. **Magee, L., A. Wolf, R. Howe, J. Schubbe, K. Hagenow**, B. Turner. 2021. Density dependence and habitat heterogeneity regulate seedling survival in a North American temperate forest. **Forest Ecology and Management** 480: 118722  
<https://www.sciencedirect.com/science/article/pii/S0378112720314912>

4. Davies, S.J., I. Abiem, K. Abu Salim, S. Aguilar, D. Allen, A. Alonso, K. Anderson-Teixeira, A. Andrade, G. Arellano, P.S. Ashton, P.J. Baker, M.E. Baker, J.L. Baltzer, Y. Basset, P. Bissengou, S. Bohlman, N.A. Bourg, W.Y. Brockelman, S.B. David, F.R.P. Burslem, M. Cao, D. Cárdenas, L-W. Chang, C-H. Chang-Yang, K-J. Chao, W-C. Chao, H. Chapman, Y-Y. Chen, R.A. Chisholm, C. Chu, G. Chuyong, K. Clay, L.S. Comita, R. Condit, S. Cordell, H.S. Dattaraja, A.A. de Oliveira, J. den Ouden, M. Detto, C. Dick, X. Du, Á. Duque, S. Ediriweera, E.C. Ellis, N.L.E. Obiang, S. Esufali, C.E.N. Ewango, E.S. Fernando, J. Filip, G.A. Fischer, R. Foster, T. Giambelluca, C. Giardina, G.S. Gilbert, E. Gonzalez-Akre, I.A.U.N. Gunatilleke, C.V.S. Gunatilleke, Z. Hao, B.C.H. Hau, F. He, H. Ni, **R.W. Howe**, S.P. Hubbell, A. Huth, F. Inman-Narahari, A. Itoh, D. Janík, P.A. Jansen, M. Jiang, D.J. Johnson, F.A. Jones, M. Kanzaki, D. Kenfack, S. Kiratiprayoon, K. Král, L. Krizel, S. Lao, A.J. Larson, Y. Li, X. Li, C.M. Litton, Y.L. Shirong Liu, S.K.Y. Lum, M.S. Luskin, J.A. Lutz, H.T. Luu, K. Ma, J.-R. Makana, Y.

Malhi, A. Martin, C. McCarthy, S.M. McMahon, W.J. McShea, H. Memiaghe, X. Mi, D. Mitre, M. Mohamad, L. Monks, H.C. Muller-Landau, P.M. Musili, J.A. Myers, A. Nathalang, K. Min Ngo, N. Norden, V. Novotny, M.J. O'Brien, D. Orwig, R. Ostertag, K. Papathanassiou, G.G. Parker, R. Pérez, I. Perfecto, R.P. Phillips, N. Pongpattananurak, H. Pretzsch, H. Ren, G. Reynolds, L.J. Rodriguez, S.E. Russo, L. Sack, W. Sang, J. Shue, A. Singh, G-Z.M. Song, R. Sukumar, I-F. Sun, H.S. Suresh, N.G. Swenson, S. Tan, S.C. Thomas, D. Thomas, J. Thompson, B.L. Turner, A. Uowolo, M. Uriarte, R. Valencia, J. Vandermeer, A. Vicentini, M. Visser, T. Vrska, X. Wang, X. Wang, G.D. Weiblen, T.J.S. Whitfeld, **A.T. Wolf**, S.J. Wright, H. Xu, T.L. Yao, S.L. Yap. 2021. ForestGEO: Understanding forest diversity and dynamics through a global observatory network. **Biological Conservation** 253: 108907.

<https://www.sciencedirect.com/science/article/pii/S0006320720309654>

5. Grand, J., S.P. Saunders, N.L. Michel, L. Elliott, S. Beilke, A. Bracey, T.M. Gehring, **E.E. Gnass Giese**, **R.W. Howe**, B. Kasberg, N. Miller, G.J. Niemi, C.J. Norment, D.C. Tozer, J. Wu, and C. Wilsey. 2020. Prioritizing coastal wetlands for marsh bird conservation in the U.S. Great Lakes. **Biological Conservation** 249:108708.

<https://www.sciencedirect.com/science/article/abs/pii/S0006320720307667>

6. P.R. Schilke, M. Bartrons, J.M. Gorzo, M.J. Vander Zanden, C. Gratton, **R.W. Howe**, A.M. Pidgeon. 2020. Modeling a cross-ecosystem subsidy: forest songbird response to emergent aquatic insects. **Landscape Ecology** 35:1587-1604.

<https://link.springer.com/content/pdf/10.1007/s10980-020-01038-0.pdf>

7. Fung, T., R.A. Chisholm, K. Anderson-Teixeira, N. Bourg, W.Y. Brockelman, S. Bunyavejchewin, C-H. Chang-Yang, R. Chitra-Tarak, G. Chuyong, R. Condit, H.S. Dattaraja, S. J. Davies, C.E.N. Ewango, **G. Fewless**, C. Fletcher, C.V. Savitri Gunatilleke, I.A.U. Nimal Gunatilleke, Z. Hao, J.A. Hogan, **R. Howe**, C-F. Hsieh, D. Kenfack, Y. Lin, K. Ma, J-R. Makana, S. McMahon, W.J. McShea, X. Mi, A. Nathalang, P.S. Ong, G. Parker, E-P. Rau, J. Shue, S-H. Su, R. Sukumar, I-F. Sun, H.S. Suresh, S. Tan, D. Thomas, J. Thompson, R. Valencia, M.I. Vallejo, X. Wang, Y. Wang, P. Wijekoon, **A. Wolf**, S. Yap, J. Zimmerman. 2020. Temporal population variability in local forest communities has mixed effects on tree species richness across a latitudinal gradient. **Ecology Letters** 23: 160-171.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/ele.13412>

8. Soulliere, G.J., M.A. Al-Saffar, K.R. VanBeek, C.M. Tonra, M.D. Nelson, D.N. Ewert, T. Will, W.E. Thogmartin, K.E. O'Brien, S.W. Kendrick, A.M. Gillet, J.R. Herkert, **E.E. Gnass Giese**, M.P. Ward, and S. Graff. 2020. Upper Mississippi / Great Lakes Joint Venture Landbird Habitat Conservation Strategy - 2020 Revision. U.S. Fish and Wildlife Service, Bloomington, Minnesota, USA.

9. **Lafkas, D., A. Wolf, and R. Howe**. 2020. Cat Island Great Lakes Piping Plover Recovery 2020 Seasonal Report. Cofrin Center for Biodiversity, University of Wisconsin-Green Bay/US Fish and Wildlife Service, Green Bay Office. 19 pp.

10. **Howe, R., A. Wolf, B. Webster, E. Gnass Giese, M. Hoff, P. Baumgart, L. Terrien,** and J. Noordyk. 2020. East Shore Lower Green Bay Watershed Plan: Habitat Conservation Plan. 53 pp.

11. **Gnass Giese, E.E., B.G.G. Kupsky, R.W. Howe, A.L. Stevens,** and **A.T. Wolf.** 2020. Evaluating Progress Toward Removing Fish and Wildlife Habitat and Populations Beneficial Use Impairments in the Lower Green Bay & Fox River Area of Concern. Technical report submitted to the Wisconsin Department of Natural Resources and the U.S. Environmental Protection Agency.

[https://www.uwgb.edu/UWGBCMS/media/gbaoc/images/LgbFrAoc\\_MetricsPlan\\_v20200407.pdf](https://www.uwgb.edu/UWGBCMS/media/gbaoc/images/LgbFrAoc_MetricsPlan_v20200407.pdf)

12. **Boulanger, N.** 2021. A survey of resident bats at the new Wequiock Creek Natural Area in Brown County, WI. Master's Thesis. University of Wisconsin-Green Bay. 42 pp.

### **Presentations:**

1. Carrozzino-Lyon, A. and **E.E. Giese.** 2021. Take Flight! Discover Bird Watching in Brown County. Green Bay Retired Men's Club. 27 April 2021. (online)

2. **Giese, E.E.** 2021. Take Flight! Discover Bird Watching in Brown County. UW-Green Bay's Lifelong Learning Institute. Oral Presentation. 11 February 2021. (online)

3. **Hirsch, B. E.E. Gnass Giese,** and **R. Howe.** 2021. Anuran Occurrences in High & Low Water within the Lower Green Bay & Fox River AOC. Wisconsin Wetlands Association Conference, Virtual. Poster Presentation. February 2021.

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