

## Brad Swanson – Biography

I earned a BS in Biology from the University of Michigan, an MS in Zoology from the University of Idaho, and a Ph.D. from Purdue university in Biology. I have been a member of Sigma Xi for over 30 years, and continuously involved in scientific research since 1987. The majority of my academic career has been spent at Central Michigan University (CMU). The accomplishments below will likely pale in comparison to other candidates. However, I am quite proud of them, especially given that they were obtained in the milieu of a 3/3 teaching load required by CMU, and in my desire to be active in organizations within our local community as well as science related organizations.

Once I had established myself at CMU and earned tenure, I felt the desire to take on more administrative duties, while also maintaining my research lab. Towards that end, I have served as our Director of Environmental Studies (an intercollege program spanning two colleges and 8 departments), Chairperson of our Academic Senate, and am currently the Director of Graduate Studies for the University. What I have enjoyed most about these opportunities is that all of them have allowed me to interact with the entire diversity of disciplines found within a university setting. I have a much better understanding of how research and education is done across fields than if I would have siloed myself away within a single department or even a college within CMU. I have maintained my research productivity and mentoring of graduate (40 total students supervised) and undergraduate (over 50 students supervised) students. With the help of these students, I have published 42 papers, and had my work presented at 102 national/international conferences, and secured over \$1,000,000 in grant funding.

I am also active in working with several organizations from the international to the local level. From the standpoint of scientific societies, I have been most active with the American Society of Mammalogists, where I have served on several committees (especially those associated with students) and the editorial board, as an Associate Editor for 12 years. During this period, I have organized discussion panels on writing publications and being an effective peer-reviewer. In my role as Director of Graduate Studies, I am also CMU's representative to MAGS (Midwestern Association of Graduate Schools) and CGS (Council of Graduate Schools). While I am new to these organizations, I have volunteered to serve on two committees within these organizations as well. I am also active in supporting local science, as a member of the science advisory board for Pierce Cedar Creek Institute (PCCI) since 2007. My favorite part of my role at PCCI is helping to evaluate the grant proposals submitted by students for PCCI's 10 – 20 funded summer research opportunities each year. I am also active in our local Toys for Tots and animal shelter, mostly with fund raising (I have raised over \$35,000 for the organizations over the last several years) and working to bring CMU student volunteers to these groups.

I recently stepped down from my editorial role for the American Society of Mammalogists and have the desire to devote my energies to a new endeavor. Towards that end, I am running to be the Director of the North Central Region for Sigma Xi.

## Brad Swanson – Candidate Statement

The world is experiencing a perilous moment in history, where the value of scientific evidence is discounted in the face of anecdotes and lies. While a healthy skepticism is a virtue in science, skepticism can turn virulent when it is motivated by politics rather than theories and data. The speed with which the public lost trust in science is highlighted by the change in tone of two reports from Pew. In August of 2020 Pew published “Public confidence in scientists has remained stable for decades”, compared to February of 2021, “Why we must rebuild trust in science”. The issue is also in the current issues of American Scientist. Sigma Xi is positioned to take a more active role in working to stem this distrust in science and scientists. One of my goals, if elected will be to help Sigma Xi expand its outreach and education efforts to the general public regarding how science works and the power of the scientific methods.

A second goal will be to increase the membership and diversity of Sigma Xi. The lifeblood of any fee-based membership institution is recruitment and retention. If elected, I would like to develop an incentive plan to encourage members to nominate new members. Sigma Xi members already believe in the institution, so we should not have difficulty in getting them to nominate new members. An incentive for nomination would be recognition awards for helping build membership and diversity. Additionally, to encourage diversity, I would encourage waiving fees for first time members from underrepresented groups.

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### 1. Professional Preparation

Ph. D. in Biology 2001. Purdue University - West Lafayette, IN  
M.S. in Zoology 1993. University of Idaho - Moscow, ID  
B.S. in Biology 1990. University of Michigan - Ann Arbor, MI

### 2. Appointments

Director of Graduate Studies	5/2021 – Present
Interim Director of Graduate Studies	7/2020 – 5/2021
Chair Academic Senate	7/2017 – 7/2020
Director of Environmental Studies	8/2010 – 8/2014
Professor of Biology	8/2010 – Present
Associate & Tenure Professor of Biology	8/2006 – 7/2010
Assistant Professor of Biology	8/2001 – 7/2006
Gonzaga University – Visiting Instructor	8/2000– 8/2001
University of Wisconsin – Stevens Point Visiting Instructor	8/1999 – 8/2000

### 3. Representative Publications; 42 peer-reviewed publications total

Phillips, P., T. M. Livieri, and B. J. Swanson. 2020. Genetic signature of disease epizootic and reintroduction history in an endangered carnivore. *Journal of Mammalogy* 101: 779-789.

Phillips, P., and B. J. Swanson. 2018. Impact of time and space on dragonfly population structure. *Ecology and Evolution* 8:7206–7215. <https://doi.org/10.1002/ece3.4255>

Torstrom, S., K. Pangle, and B. J. Swanson. 2014. Shedding Subspecies: the influence of genetics on reptile subspecies taxonomy. *Molecular Phylogenetics and Evolution* 76: 134-143.

Dresser, C. and B. J. Swanson. 2013. Preemptive legislation inhibits the anthropogenic spread of rusty crayfish (*Orconectes rusticus*). *Biological Invasions* 15: 1049-1056

Sundaram, M., J. R. Willoughby, and B. J. Swanson. 2013. Indirect evidence of prey-switching in minks: empirical evidence, theoretical modeling, and spatial drivers. *Journal of Mammalogy* 69: 186 - 198.

Cain, C. M., T. M. Livieri, and B. J. Swanson . 2011. Genetic evaluation of a reintroduced population of black-footed ferrets (*Mustela nigripes*). *Journal of Mammalogy* 92: 751-759

Marsack, K., and B. J. Swanson. 2009. Impact of road-based fragmentation on eastern box turtles (*Terrapene c. Carolina*). *Copeia* 2009: 647 – 652.

Millions, D. G., and B. J. Swanson. 2007. Impact of natural and artificial barriers to dispersal on the population structure of bobcats. *Journal of Wildlife Management* 71: 96 – 102.

Swanson, B. J. and D. R. Johnson. 1999. Distinguishing causes of intraspecific synchrony in population dynamics. *Oikos* 86: 265-274.

Swanson, B. J. 1998. Autocorrelated rates of change in animal populations and their relationship to precipitation. *Conservation Biology* 12: 801-808.

### 4. Research Leadership (total since arriving at CMU = \$1,164,666; all but one grant as PI)

- 2019 – 2021 Little Traverse Bay Bands of Odawa Indians: Genetic identification of rice in Michigan \$29,773
- 2016 – 2018 Little River Band of Ottawa Indians: Genetic identification of rice in Michigan \$29,773
- 2015 – 2019 Wisconsin Department of Natural Resources: Using scat as a molecular mark-recapture analysis to estimate population size of wolves (*Canis lupus*) \$50,100
- 2015 – 2017 Minnesota Department of Natural Resources: Estimating population structure in four turtle species. \$10,300
- 2012 – 2014 Wisconsin Department of Natural Resources: Genetic analysis of Sharp-tailed Grouse population. \$25,000

## **5. Leadership and Professionalism: Synergistic Activities**

1. I have held several leadership positions within Central Michigan University; my goals as a leader are to facilitate student success while maintaining the rigor of the educational process. While the Director of Environmental Studies, I (1) revised the curriculum, (2) brought the program through program review where it received the highest possible ranking, and (3) developed an internship program which saw 100% of the students finding career appropriate internships. Following my role as the Director of Environmental Studies, I was elected as the Chairperson of the Academic Senate, which is a legislative body at CMU, rather than just an advisory body. The Academic Senate approves all academic and curricular issue within the university. During my tenure the Senate I was instrumental in (1) facilitating passage of a University-wide review of academic reorganization, (2) revising requirements for the BA and BS degrees which reduced the number of proscribed courses for each degree by 18 credits, facilitating timely completion of the degree, (3) reducing all degrees that lack accreditation mandates to 120 credits, (4) revising the curricular process to facilitate more timely approval, and (5) revising the Student Evaluation of Teaching process. Currently, I am the Director of Graduate Studies at CMU (the equivalent of Dean of Graduate Studies). During the last year in this role I have (1) developed a plan for the distribution of Graduate Assistant funds to increase the diversity of graduate students, (2) organized single university wide information page for international students regarding Covid-19 issues, (3) revised and streamlined approval process for Graduate Faculty status, (4) developed a social media presence for the Office of Research and Graduate Studies and redesigned the website for Office of Graduate Studies, (5) reduce the credits required for Graduate Certificate to increase competitiveness of CMU, (6) developed a new Incomplete policy to facilitate timely completion by students and reduce their tuition burden, and (7) developed new funding programs for undergraduate and graduate research and presentation grants.
2. Throughout my career worked to expose students to forensic science and have been asked to work with law enforcement agencies as a wildlife forensic biologist. I have often partnered with the Isabella County Sheriff's Office to identify bones found during searches for missing persons, to determine if they were human. I have work on domestic cat mutilation cases for the Salt Lake City Police Department and the Bothell, WA police department to determine if humans, or non-human animals, were responsible for a series of cat deaths in their communities. Additional work in this area includes collaborating with the Michigan State Police, local Michigan police departments, and agencies from 5 other states on providing evidence in wildlife crimes. Lastly, I ran one-week summer

camps for approximately 150 high school students at Central Michigan University where they received hands-on training in forensic science techniques.

3. Since 2007 I have served on the Science Advisory Board at Pierce Cedar Creek Institute (PCCI). During this period, I have served on their strategic planning committee twice, worked with over 100 undergraduate students in a professional development aspect at the institute, and served on their land stewardship committee where I developed an adopt an ash tree program to help fund treating the ash trees on PCCI's property for the invasive emerald ash-borer.
4. I was elected to the Editorial Board of the Journal of Mammalogy in 2009, and re-elected for 4 total terms, at which point I stepped down. Over these 12 years, I was the associate editor for approximately 220 submissions. During this period, I also worked with the American Society of Mammalogists to have workshops on peer-reviewing and paper submission at our annual meetings.
5. I have been asked to serve on several committees devoted to the recovery of threatened and endangered species including the Sharp-tailed grouse Recovery Committee and the Prairie Grouse Recovery committee for the State of Wisconsin, on the Massasauga rattlesnake genetic recovery committee for the State of Texas, and on the genetic recovery committee for the black-footed ferret for the US Fish and Wildlife Service.

## **6. Commitment to Diversity and Inclusiveness**

I have been active in issues of Diversity, Equity, and Inclusion as a member of the Diversity, Equity, and Inclusion Council at CMU. Within my Division, the Office of Research and Graduate Studies, I am responsible for developing the DEI goals for our division, monitoring the implementation of the goals, and reporting the outcomes. In addition, I have developed funding for graduate students to increase diversity at CMU across each College. Within my own lab, I actively encourage diverse individuals to apply to work in my lab. While this can be particularly difficult in central Michigan, I have successfully mentored students of color, diverse gender identities, and individuals living with a mental health issue.

## **7. Mentoring**

Since starting my career, I have always taken an active role in mentoring new scientists from undergraduate students to new faculty members, with some examples described below.

- During the 10 years Central Michigan University had a new faculty mentoring program, I served as a mentor to 6 new faculty from 4 different departments. All of these faculty have earned tenure. In addition, I have served as an advocate in 6 cases where the University Administration initially denied a tenure or promotion request and was successful in convincing the University Administration to reverse their negative decision in each case.
- I have been the major (thesis) advisor for 37 Master's students, and currently mentor 3 MS students. Fourteen of these students went on to complete a PhD, and 100% are employed in a field of biology.
- I have mentored 58 undergraduate research students for a duration of  $\geq 1$  year. Of these 58 students, 46 of them produced an undergraduate thesis and 53 completed at least one post-graduate degree.

- Across these graduate and undergraduate students, a total of 102 presentations have been given at national and international meetings since my arrival at CMU.
- In addition, I mentor students at the American Society of Mammalogist meetings each year by serving as a reviewer on student presentations, participating in the Breakfast with a Mammalogist program, and serving on panels on publishing and peer-reviewing.

## **8. Awards, Fellowships, Invited Lectureships and Honors**

2020 – Awarded President’s Award for Outstanding Research.\*

2018 – Nominated for the President’s Award for Community Service.\*

2010 – Selected to attend the Biology Leadership Conference VII. The conference is designed to provide a forum for general biology teachers to meet, interact, and share insights and strategies on effective teaching/learning strategies and mentoring

2010 – Selected to attend McGraw Hill Symposium on teaching biology majors. One of 15 faculty selected nationwide to attend a symposium hosted by McGraw Hill to discuss the future of educating biology majors.

2009 – Nominated and elected to the editorial board of the Journal of Mammalogy as an associate editor. Elected to a fourth term continuing through 6/2021

2009 – Selected to attend McGraw Hill symposium on advanced pedagogical techniques in biology. One of 20 faculty selected nationwide to attend a symposium hosted by McGraw Hill to discuss the future of educating biology majors.

2009 – Central Michigan University Teaching Excellence Award.\*

2007 – Provost Award for Outstanding Research.\*

\* = Nominated by colleagues and selected by a university-wide committee for outstanding research by a tenured faculty member.

## **9. Major Career Contributions and Legacy**

- My major legacy is being a mentor who facilitated bringing new scientists in to the field; my goal for this is to have mentored 50 graduate students and 75 undergraduate students over the course of my career.
- I have had the most impact in the field of conservation, working to facilitate the preservation of threatened and endangered species, including what was the rarest mammal in the world at one point the black-footed ferret (*Mustela nigripes*).
- Significant research findings
  - Using genetic techniques to evaluate subspecies status biases the results to elevate evaluated organisms to a full species.
  - The long life span of turtles and tortoises results in the genetic consequences of a bottleneck progressing in slow motion relative to the demographic consequences.
  - Roads act as significant barriers for mesocarnivores.
  - A method for distinguishing the causes of intraspecific synchronous population dynamics.
  - Determining the minimum number of years needed to estimate autocorrelation in ecological data sets.