Daphne Anne Gille

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EDUCATION

PhD in Genetics, University of California, Davis 2016
Title: Genetic improvement of aquaculture and wildlife management
Co-advisors: Bernie May and Holly Ernest

MS in Organismal Biology, Conservation & Ecology, San Jose State University 2012
Title: Genetic population structure and cryptic speciation of ghost shrimp (*Neotrypaea californiensis*) in North American west coast estuaries
Advisor: Leslee Parr

BS in Biochemistry & Molecular Biology, University of California, Santa Cruz 2007
Title: Murine antibody response to multiple strains of *Helicobacter pylori*
Senior thesis advisor: Karen Ottemann

RESEARCH AND PROFESSIONAL EXPERIENCE

Research Scientist I (Postdoc), California Department of Fish and Wildlife 2017 – present
Wildlife Genetics Research Laboratory

- Generate a contiguous assembly of the mule deer (*Odocoileus hemionus*) genome using the PacBio RSII sequencing platform
- Identify adaptive genetic differences in populations of mule deer and bighorn sheep (*Ovis canadensis*) across environmental gradients (e.g., elevation) using RADseq data
- Assess statewide genetic structure and genetic diversity differences among indigenous and translocated populations of bighorn sheep in Arizona using microsatellite data

Postdoctoral Scholar, University of California Davis 2016 – present
Animal Science Department

- Coordinate and serve as a member of a team that includes local species experts, federal and state agency managers, and university scientists whose task is to develop a reintroduction plan for the threatened delta smelt (*Hypomesus transpacificus*)
- Design and execute reintroduction experiments using an existing refugial population of delta smelt

- Identify a genetic marker for sex determination in white sturgeon (*Acipenser transmontanus*) using Illumina high-throughput sequencing
- Analyze relatedness and identify migratory patterns among raptors in the San Francisco Bay Area using microsatellite genotyping
- Supervise and mentor graduate and undergraduate students in the laboratory and provide help with scientific writing

Recovery Biologist, U.S. Fish and Wildlife Service 2016 – 2017
Endangered Species Recovery Division
- Evaluated and made approval recommendations for federal endangered species 10(a)(1)(A) recovery permit applications
- Coordinated endangered species recovery efforts and interacted with federal and state agency managers, university scientists, environmental consultants, and the public

Student Trainee (Biology), U.S. Fish and Wildlife Service 2012 - 2016
Student Career Experience/Pathways Program, Endangered Species Division
- Wrote five-year review of the status of the endangered vernal pool species, Contra Costa goldfields (*Lasthenia conjugens*)
- Wrote recovery plan for the endangered showy Indian clover (*Trifolium amoenum*)

Graduate Student Researcher, University of California Davis 2009 – 2016
Animal Science Department; Department of Population Health and Reproduction
- Examined effects of culture conditions on and heritability of ovarian adiposity and caviar yield in cultured white sturgeon
- Performed Illumina high throughput sequencing and *de novo* sequence assembly using Linux programming to identify genetic markers useful for determining sex and population structure in white sturgeon
- Developed a flow cytometry assay to examine ploidy level of captive reared and wild-caught white sturgeon
- Screened microsatellite loci and identified a panel of 14 that improved white sturgeon parentage assignment to 95% within families
- Screened microsatellite loci and sequenced mitochondrial DNA to assess population structure of Arizona desert and Rocky Mountain bighorn sheep
- Performed DNA extraction from ancient and contemporary Channel Island sea otters (*Enhydra lutris*); DNA capture and Illumina high throughput sequencing of these samples to assess evolution of major histocompatibility genes are on-going
- Screened microsatellite loci of yellow-billed magpie (*Pica nuttalli*) to assess population structure after the introduction of West Nile Virus
- Analyzed and identified single nucleotide polymorphisms in California hummingbirds
- Mentored and supervised undergraduate student research volunteers
- Advanced to candidacy November 2011

Biological Science Technician, U.S. Geological Survey Summer 2012
Western Ecological Research Center, Davis Field Station

- Performed gene expression analysis using quantitative PCR to diagnose sea otter health and response to contaminants, parasites, and stress throughout nearshore ecosystems ranging from California to Alaska

Graduate Student Researcher, San Jose State University 2007 - 2009
- Examined population structure of ghost shrimp using mitochondrial DNA among west coast estuaries
- Identified hybrid shrimp species found in Channel Island estuaries
- Analyzed time of introduction of Pacific Northwest ghost shrimp into Southern California estuaries
- Mentored and supervised undergraduate student research volunteers

Research Associate II, Cellerant Therapeutics 2004 - 2009
- Optimized culture conditions and cryopreservation procedures of myeloid progenitors (MP) from murine hematopoietic stem cells (HSC)
- Designed and executed mouse model experiments to determine the radioprotective capabilities and *in vivo* distribution of transplanted murine MP and HSC following lethal-dose radiation
- Performed mouse model experiments to examine the reversal of lupus-like symptoms following murine MP and HSC transplantation

Chemistry Teacher & Tutor, Merit Academy 2002 - 2004
- Designed course curriculum, lectures, and laboratory experiments for a high school chemistry course
- Tutored elementary through high school level chemistry, biology, health, and mathematics

Undergraduate Researcher, University of California Santa Cruz 1999 - 2003
- Examined murine survival and antibody response to *H. pylori* infection using flow cytometry and ELISA assays
- Prepared and performed elemental analysis of oceanographic sediment samples
- Prepared buffers and performed general lab maintenance

PUBLICATIONS

Gille DA, Buchalski M, Conrad D, Rubin E, Munig A, Wakeling B, Epps C, Creech T, Crowhurst R, Holton B, Monello R, Boyce W, Penedo C, Ernest H. Genetic outcomes of translocation of bighorn sheep (*Ovis canadensis*) in Arizona. *In internal review* (planned submission to Journal of Wildlife Management)

Gille DA, Van Eenennaam JP, Famula TR, May BP, Schreier AD, Beer K, Struffenegger P, Renschler B, Bishop S, Doroshov SI. 2017. Finishing diet, genetics, and other culture conditions affect ovarian adiposity and caviar yield in cultured white sturgeon (*Acipenser transmontanus*). Aquaculture, 474:121-129.

Buchalski MR, Sacks BN, **Gille DA**, Penedo MCT, Ernest HB, Morrison SA, Boyce WM. 2016. Phylogeographic and population genetic structure of bighorn sheep (*Ovis canadensis*) in North American deserts. Journal of Mammalogy, gyw011.

Meek MH, Wells C, Tomalty KM, Ashander J, Cole EM, **Gille DA**, Putman BJ, Rose JP, Savoca MS, Yamane L, Hull JM. 2016. We should not be afraid to talk about fear of failure in conservation. Biological Conservation, 194:218-219.

Domen J, Christensen JL, **Gille D**, Smith-Berdan S, Fong T, Brown JMY, Sedello AK. 2016. Cryopreserved ex vivo-expanded allogeneic myeloid progenitor cell product protects neutropenic mice from a lethal fungal infection. Cell Transplantation, 25:17-33.

Meek MH, Wells C, Tomalty KM, Ashander J, Cole EM, **Gille DA**, Putman BJ, Rose JP, Savoca MS, Yamane L, Hull JM, Rogers DL, Rosenblum EB, Shogren JF, Swaisgood RR, May B. 2015. Fear of failure in conservation: the problem and potential solutions to aid conservation of extremely small populations. Biological Conservation, 184:209-217.

Buchalski MR, Navarro AY, Boyce WM, Vickers TW, Tobler MW, Nordstrom L, Garcia JA, **Gille DA**, Penedo MCT, Ryder OA, Ernest HB. 2015. Genetic population structure of Peninsular bighorn sheep (*Ovis canadensis nelsoni*) indicates substantial gene flow across US-Mexico border. Biological Conservation, 184:218-228.

Gille DA, Famula TR, May BP, Schreier AD. 2015. Evidence for a maternal origin of spontaneous autopolyploidy in culture white sturgeon (*Acipenser transmontanus*). Aquaculture, 435:467-474.

Schreier AD, May B, **Gille DA**. 2013. Incidence of spontaneous autopolyploidy in cultured populations of white sturgeon, *Acipenser transmontanus*. Aquaculture, 416:141-145.

Singh VK, Christensen J, Fatanmi OO, **Gille D**, Ducey EJ, Wise SY, Singh PK, Karsunky H, Sedello AK. 2012. Myeloid progenitors: a radiation countermeasure that is effective when initiated days after irradiation. Radiation Research, 177:781-791.

Drauch Schreier A**, Gille DA**, Mahardja B, May B. 2011. Neutral markers confirm the octoploid origin and reveal spontaneous polyploidy in white sturgeon, Acipenser transmontanus. Journal of Applied Ichthyology, 27(Suppl. 2):24-33.

Gille DA. 2012. Genetic population structure and cryptic speciation of ghost shrimp (*Neotrypaea californiensis*) in North American west coast estuaries. Master's Theses. Paper 4243.

Smith-Berdan S, **Gille D**, Weissman IL, Christensen, JL. 2007. Reversal of autoimmune disease in lupus-prone NZB/NZW mice by nonmyeloablative transplantation of purified allogeneic hematopoietic stem cells. Blood, 110:1370-1378.

TECHNICAL REPORTS

Gille D, Ernest H. 2014. Final Report: Genetic assessment of Arizona desert bighorn sheep. Prepared for the Arizona Department of Game and Fish, Task Order #11-01.

Schreier AD, **Gille D**, May B. 2013. 2012 Genetic diversity and genome size monitoring of the Kootenai Tribe of Idaho white sturgeon conservation aquaculture program. Prepared for the Kootenai Tribe of Idaho, Award #37267.

Schreier AD, **Gille D**, May B. 2012. 2011 Genetic diversity and genome size monitoring of the Kootenai Tribe of Idaho white sturgeon conservation aquaculture program. Prepared for the Kootenai Tribe of Idaho, Award #016333.

TEACHING EXPERIENCE

Mentor to undergraduate student researchers at UC Davis 2012 – 2015
- Revati Vishwasrao
- Deepinder Sidhu
- Lucia Yee
- Ryan Lew

Guest Lecturer, ECL 242 Ecological Genetics, UC Davis 2013
- Topic: Fun with polyploidy genetics and white sturgeon
- Topic: Sequencher laboratory

Guest Lecturer, NATR 305 Fisheries Ecology and Management, American River College 2012
- Topic: The use of genetics in aquaculture: what can we do?

Guest Lecturer, ECL 242 Ecological Genetics, UC Davis 2012
- Topic: Fun with polyploidy genetics and white sturgeon

Guest Lecturer, Integrated Studies Freshman Seminar, UC Davis 2012
- Topic: Conservation genetics of white sturgeon

Teaching Assistant BIS 101: Genes and Gene Expression, 2011
University of California Davis
- Led discussion sections and held office hours for 120 students
- Led review sessions, wrote exam questions, and graded exams for 300 students

Mentor to undergraduate student researchers at San Jose State University 2007 - 2009
- Mira Brahambatt
- Cindy Bick

Teaching Assistant BIOL 205: Graduate Advanced Molecular Techniques, 2008
San Jose State University
- Responsible for several lectures and assisting in laboratory set up and procedure
- Designed and graded flow cytometry laboratory exercises and wrote exam questions for this topic

Chemistry Teacher & Tutor, Merit Academy 2002 - 2004

- See above in "Research and Professional Experience"

GRANTS AND AWARDS

2015 UC Davis & Humanities Graduate Research Award	$1500
2014 UC Davis Hart, Cole, Goss Fellowship	$4200
2013 UC Davis Henry A. Jastro Graduate Research Scholarship Award	$2298
2013 UC Davis Hart, Cole, Goss Fellowship	$4200
2013 UC Davis & Humanities Graduate Research Award	$1500
2012 UC Davis Henry A. Jastro Graduate Research Scholarship Award	$2940
2012 UC Davis & Humanities Graduate Research Award	$1500
2012 UC Davis Wildlife Health Center Fellowship	$5000
2012 International Plant and Animal Genome conference travel grant	$1000
2011 UC Davis & Humanities Graduate Research Award	$1500
2010 UC Davis & Humanities Graduate Research Award	$1500
2010 UC Davis Veterinary Genetics Laboratory Scholarship	$12880
2008 San Jose State University Albert and Dorothy Ellis Scholarship	$1000
1999 UC Santa Cruz Regents Scholarship - all undergraduate tuition paid	

INVITED PRESENTATIONS

"Using Genetics for the Improvement of Caviar Farming in White Sturgeon". D. Gille. San Jose State University, Department of Biological Sciences seminar series. February 2013.

"Arizona and Rocky Mountain Bighorn Sheep (*Ovis canadensis*) Genetic Population Structure." D. Gille, H. Ernest. Arizona Desert Bighorn Sheep Society annual meeting. November 2012.

"Using Genetics for the Improvement of Caviar Farming in White Sturgeon (*Acipenser transmontanus*)." D. Gille, A. Drauch Schreier, B. May. University of California Davis Genetics Graduate Group student recruitment seminar. February 2012.

"There's something about sturgeon." D. Gille, A. Drauch Schreier, B. May. University of California Davis Genetics Graduate Group student recruitment seminar. February 2011.

ORAL & POSTER PRESENTATIONS

Genetic diversity among native and nonnative bighorn sheep populations in Arizona. **D. Gille**, M. Buchalski, W. Boyce, D. Conrad, E. Rubin, A. Munig, B. Wakeling, C. Epps, T. Creech, R. Crowhurst, B. Holton, R. Monello, H. Ernest. Desert Bighorn Council, St. George, UT, April 2017.

Can Wakasagi (*Hypomesus nipponensis*) culture in Japan inform Delta Smelt experiments and population reinforcement? **D. Gille**. Interagency Ecological Program, Folsom, CA, March 2017.

Summary of Genetic and Genomics Work at the KTOI Hatchery. A. Schreier, **D. Gille**, and J. Van Eenennaam. Kootenai River White Sturgeon Co-Managers Meeting, Bonners Ferry, ID, August 2013.

Discovering a genetic marker for sex determination in white sturgeon (*Acipenser transmontanus*). **D. Gille**, B. May, A. Schreier. 7th International Symposium on Sturgeon, Nanaimo, BC, July 2013.

"Improving sturgeon management and aquaculture through next generation sequencing." **D. Gille**, A. Drauch Schreier, B. May. Western Division American Fisheries Society, Boise, ID, April 2013.

Identification of quantitative trait loci associated with caviar yield and ovarian adiposity in white sturgeon (*Acipenser transmontanus*). **D. Gille**, A. Drauch Schreier, B. May. Plant and Animal Genome XX, San Diego, CA, January 2012.

Neutral markers reveal spontaneous autopolyploidy in white sturgeon, *Acipenser transmontanus*. A. Drauch Schreier, **D. A. Gille**, B. Mahardja, and B. P. May. Plant and Animal Genome XIX, San Diego, CA, January 2011.

PROFESSIONAL SERVICE

UCD Genetics Graduate Group recruitment committee	2011 - 2013
UCD Coastwide Salmonid Genetics Conference co-organizer	2011 - 2012
UCD Conservation of Extremely Small Populations Symposium co-organizer	2011 - 2012

VOLUNTEER SERVICE

Animal Care Volunteer, The Marine Mammal Center 2008 - 2014

- Involved in husbandry and the administration of medical procedures of rehabilitated northern elephant seals, California sea lions, harbor seals, and northern fur seals
- Assisted with harbor seal pup satellite tagging and biological sample collection at Castro Rock, CA
- Generated a map of juvenile Northern Elephant Seal stranding hot spots along the northern California coast using ArcMap

EXTERNAL REVIEWER

Fisheries Research	2017
Aquaculture Research	2016
Conservation Genetics	2013, 2016
Global Change Biology	2013, 2016
North Pacific Research Board	2012
Canadian Journal of Fisheries and Aquatic Sciences	2012
Natural Sciences and Engineering Council of Canada	2012
Journal of Fish Biology	2011

REFERENCES

Dr. Michael Buchalski – Genetics Research Lead, California Department of Fish and Wildlife, Rancho Cordova, CA 95670
CDFW direct supervisor

Dr. Andrea Schreier – Assistant Adjunct Professor, Department of Animal Science, University of California, Davis, CA 95616
Postdoc supervisor, PhD committee member

Dr. Josh Hull – Recovery & Listing Division Chief, U.S. Fish and Wildlife Service, Sacramento, CA 95825
USFWS supervisor

Dr. Bernie May – Adjunct Professor, Department of Animal Science, University of California, Davis, CA 95616
PhD advisor