

CURRICULUM VITAE

Sara M. Turner PhD

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RESEARCH INTERESTS:

Evolutionary and Conservation Genetics

EDUCATION:

Geneticist USGS- Alaska Science Center	2009-present
Postdoctoral Fellow University of Alaska Fairbanks Advisor: Jonathan Runstadler Avian influenza surveillance in Alaska Genetics of foxes and rabies in the Arctic	2007-2009
Ph.D. Purdue University, West Lafayette, IN Advisor: Andrew DeWoody “Genetic effects on Atlantic salmon (<i>Salmo salar</i>) survivorship”	2001- 2007
B.A. Biology, Pomona College Claremont, CA “Gene flow in the terrestrial isopod <i>Ligidium lapetum</i> ”	1997- 2001

AWARDS:

2007 Bilisland Dissertation Fellowship
2006 Recipient of the Graduate Teaching Certificate sponsored by the Center for Instructional Excellence at Purdue University
2005 Honorable Mention: Evolution/Phylogenetics Oral Presentation at Midwest Ecology and Evolution meeting.
2003-2005 Purdue Research Foundation University-wide Fellowship (\$27,378)

ACADEMIC ASSOCIATIONS:

American Fisheries Society	2001-present
The Society for the Study of Evolution	2001-present
European Society for Evolutionary Biology	2001-present
Wildlife Disease Association	2008-present

RESEARCH EXPERIENCE:

Postdoctoral Research June 2007 – February 2009
University of Alaska Fairbanks, Institute of Arctic Biology, Fairbanks, AK
Train and supervise technicians and undergraduate student workers, mentor undergraduate and graduate students. Responsible for the genetic analysis and subtyping of avian

influenza from around Alaska as part of an international program for monitoring avian influenza. Assist in the direction and implementation of analysis methods, including RNA extraction, realtime PCR screening, sequencing and cloning.

Responsible for the development and analysis of microsatellite loci and multiplex reactions, mtDNA sequencing, and nuclear gene sequencing (MHC) for the arctic fox to study the population structure of foxes within Alaska. Use molecular techniques to isolate rabies from tissues of rabid foxes and sequence portions of the virus. This is part of a larger study to determine how the population dynamics of foxes influence the spread of rabies in Alaska.

Graduate Research Assistant

August 2001-May 2007

Purdue University, Dept. of Forestry and Natural Resources, West Lafayette, Indiana

I examined the effects of genome-wide relatedness and the major histocompatibility complex (MHC), a large multi-gene family that plays a fundamental role in regulating the vertebrate immune response, on offspring mortality. I analyzed the genetic effects on survivorship to three life stages. I found evidence that female internal relatedness (IR) and parental relatedness are negatively correlated with fitness, but found no MHC effects. Subsequently, I attempted to link the genetic measures analyzed with physical and fitness characteristics. Finally, I looked for a relationship between MHC zygosity and a common salmonid disease. Taken together, these results suggest that factors other than MHC may play more important roles in overall fitness of Atlantic salmon. While MHC genotype is related to resistance of specific pathogens, the combined influence of the entire community of pathogens encountered in nature may obscure the imprint of natural selection on wild populations.

Research Assistant

January 2001-May 2001

Pomona College, Claremont, CA

- Extracted data from genomes with many sequenced genes
- Calculated a variety of measurements of intron number, size, and location and examined trends in these measurements across taxa

Research Assistant

August 2000-May 2001

Pomona College, Claremont, CA

- Investigated cellular transport mechanisms in *Drosophila* embryo
- Isolated and set up crosses to create strains of mutant flies

Senior Thesis

August 2000-May 2001

Pomona College, Claremont, CA

- Investigated terrestrial isopod phylogeography using allozymes

Research Assistant

February 2000-June 2000

James Cook University, Townsville, Queensland Australia

- Isolated DNA from damselfish
- Sequenced mtDNA to construct molecular phylogeny
- Proofread and aligned sequences

Research Assistant

August 1999-December 1999

Pomona College, Claremont, CA

- Examined expression of developmental genes in hydra using *in situ* hybridization

PUBLICATIONS

Turner, S.M., J. Chaves-Campos, and J.A. DeWoody (in press). Parental relatedness and major histocompatibility effects on early embryo survivorship in Atlantic salmon. *Genetica*.

Turner, S. M., M. Faisal and J.A. DeWoody (2007). Zygosity at the major histocompatibility complex class IIB locus predicts susceptibility to *Renibacterium salmoninarum* in Atlantic salmon (*Salmo salar*). *Animal Genetics* 38: 517-519.

Bos, D. H., **S. M. Turner** and J.A. DeWoody (2007). Haplotype inference from diploid sequence data: evaluating the performance of Bayesian methods using non-neutral sequences. *Hereditas* 144: 228-234.

Turner, S.M. and J.A. DeWoody (in prep). Major histocompatibility and relatedness effects on reproductive fitness of Atlantic salmon (*Salmo salar*).

Turner, S.M. and J.A. DeWoody (in prep). Secondary sexual traits, and their influence on fitness in Atlantic salmon (*Salmo salar*).

Turner, S.M., G.M. Happ, M. Petrula and J. Runstadler (in prep). Molecular analysis of temporally sampled avian influenza.

PROFESSIONAL PRESENTATIONS and CONTRIBUTED POSTERS:

Molecular analysis of temporally sampled avian influenza. (a paper)

2008 at the Wildlife Disease Association Meeting, Edmonton, AB, Canada.

2008 at the International Conference on Diseases in Nature Communicable to Man
Regina, SK, Canada

Molecular ecology of rabies in the Arctic (a poster)

2008 at the Wildlife Disease Association Meeting, Edmonton, AB, Canada.

2008 at the International Conference on Diseases in Nature Communicable to Man
Regina, SK, Canada

Marker development for arctic foxes: a rabies vector (a poster)

2007 at the International Conference on Diseases in Nature Communicable to Man
Madison, WI.

The influence of genotype on Atlantic salmon survivorship (a paper)

2005 at the American Fisheries Society Annual Meeting Anchorage, AK.

2005 at the Midwest Ecology and Evolution Meeting Carbondale, IL.

2003 at the American Fisheries Society Annual Meeting Quebec City, QC, Canada.

The influence of genotype on Atlantic salmon survivorship (a poster)

2004 at the American Fisheries Society Annual Meeting Madison, WI.

2004 at the Conservation Genetics Workshop on Imperiled Freshwater Mollusks and Fishes Shepherdstown, WV.

2004 at the Forestry and Natural Resources Graduate Symposium Purdue University West Lafayette, IN.

Sexual selection or superior survivorship: superlative studies on salmon (a paper)

2003 at Lake Superior State University Sault St. Marie, MI.

2003 at the Midwest Ecology and Evolution Conference Akron, OH.

Genetic effect on survivorship of Atlantic salmon (a poster)

2003 at Forestry and Natural Resources Graduate Symposium Purdue University West Lafayette, IN.

2003 at Indiana The Wildlife Society and American Fisheries Society Spring Meeting Bloomington, IN.

Systematics and population genetics of Lepomid sunfishes (a poster)

2002 at The Indiana Chapter The Wildlife Society and American Fisheries Society Spring Meeting Bloomington, IN.

2002 at Midwest Ecology and Evolution Conference Bowling Green, OH.

2002 at Sigma Xi Graduate Student Research Awards Competition Purdue University West Lafayette, IN.

2002 at Forestry and Natural Resources Graduate Symposium Purdue University West Lafayette, IN.

MENTORING:

Graduate

Michelle Markovich- MS student in Forestry and Natural Resources (2004)

Post-Baccalaureate

Andrew Lester (2007-2008)

Undergraduate

Ashley Fukuoka- senior Music major (2008-present)

Kimberly Dullen- senior Biology major (2008)

Adam Estes- junior Biology major (2005-2006)

Stephanie Hucko- freshman Animal Science major (2005-2006)

Abra Foster- junior Wildlife major (2004-2005)

Jessica Benjamin- sophomore Biology major (2003-2004)

Kate Barzan- sophomore Biology major (2003)

Sarah Eddy- senior Biology major (2002-2003)

High School

Kelsey Shilling- senior (2008-present)

Daniel Tao- junior (2004-2005)

TEACHING EXPERIENCE:

Co-Instructor (1 semester, 2008) BIO 342 – Genetics (4 credit course, approx. 25 students), University of Alaska Fairbanks. An introductory genetics course required for all biology majors. I prepared and presented lectures and labs, developed homework assignments and exams, and maintained office hours.

Co-Instructor (1 semester, 2005) FNR 305 – Conservation Genetics (3 credit course, approx. 45 students), Purdue University, West Lafayette. This course focused on genetics and its applications to conservation of natural resources. For this I prepared and presented lectures, developed homework assignments and exams, and maintained office hours.

Teaching Assistant (1 semester, 2003) FNR 305 – Conservation Genetics (3 credit course, approx. 30 students), Purdue University, West Lafayette. This course focused on genetics and its applications to conservation of natural resources. My duties included preparing and presenting lectures, maintaining office hours, a website and developing quizzes.

Teaching Assistant (1 semester, 2002, 2003) FNR 242 – Ecology and Systematics of Fish and Mammals (1 credit lab, approx. 60 students), Purdue University, West Lafayette. I taught sophomore undergraduates the classification, natural history, and ecology of fishes. I maintained office hours, led help sessions, and developed quizzes, and assisted with curatorial duties.

Laboratory Assistant (1 semester, 2002) BIO 40 – Genetics (1 credit course, approx. 30 students), Pomona College, Claremont. I assisted in the lab portion of a genetics course, helped grade exams and quizzes.

Teaching and Research Seminars attended:

The Basics of Testing	Using Discussion
Subjective Tests and Assigning Grades	Student-Teacher Relationships
Designing Instruction	Intro to eInstruction
Lecturing Techniques	Responsible Conduct in Research

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Education Courses:

Philosophy of Biological Instruction: 1 credit, fall 2004.

Preparing Future Faculty: 1 credit, fall 2005

RELEVANT COURSES/WORKSHOPS:

Fish Ecology	Intro to Bioinformatics
Molecular Ecology and Evolution	Evolution
Biostatistics	Sex and Evolution
Eukaryotic Genetics	Evolution of Behavior
Population Genetics	

COMMUNITY SERVICE:

Girl Scouts- troop leader (2004-2007)

Big Brothers Big Sisters- big sister (2003-2004)

REFERENCES:

J. Andrew DeWoody (Ph.D advisor)

Associate Professor of Genetics

Department of Forestry and Natural
Resources

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Peter Waser

Professor

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Jonathan Runstadler (Post-doc advisor)

Assistant Professor of Biology and Wildlife

Institute of Arctic Biology

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