

Rebecca S. Colby

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Skills/ Qualifications

- Laboratory: cDNA reverse transcription, gel electrophoresis, primer design, alignment building/interpreting, PCR, PCR product purification, RT-qPCR, EIA (enzyme immunoassay), larval fish rearing, otolith extraction and processing, aging fish with otoliths and scales
- Fieldwork: Purse seining, beach seining, electrofishing, snorkeling, fyke netting, stream seining, gill netting, angling (spin reel and fly fishing), PIT tagging (ventral and dorsal), gravelometry, stream discharge, thalweg depth
- Computer: Microsoft Word, Excel, PowerPoint, CLC genomics, Geneious
- Other: Strong swimmer, boater's license, PADI Open Water, kayaking, canoeing, Game of Logging Chainsaw Safety Level 1 & 2 Certified, manual transmission vehicle operation, public speaking and on-stage performance, wildlife photography, net mending

Research Experience/ Employment

MSU/MDNR BLACK RIVER STURGEON HATCHERY AND RESEARCH FACILITY
Fisheries Technician

Onaway, MI
April 2016-Present

Topic: Lake Sturgeon Ecology and Production

- Field duties involved in handling adult Lake Sturgeon include wetsuit snorkeling in the Black River to capture adult Lake Sturgeon, performing and recording weight and length measurements, PIT, RFID, and floy tagging, and expressing and collecting gametes from actively spawning captured sturgeon.
- Field work involving larval sturgeon includes hiking gear (drift nets, cod ends, anchors, buckets, etc.) into field sites, deploying drift nets in the Black River, monitoring drift nets and collecting samples from cod ends during night hours (generally 9pm-2am), and sorting cod end samples to find and collect drifting larval sturgeon.
- General field work includes collecting stream discharge data, moving equipment for PIT antenna arrays, and barge and backpack electrofishing for larval sturgeon predators.
- Hatchery work includes fertilization of Lake Sturgeon gametes collected from the field, monitoring, flow adjusting, and peroxide treating of egg jars, identifying dead eggs and removing them from egg jars, counting hatched free embryos, rearing and harvesting brine shrimp for feeding, preparing blood worms for feeding to larval and 1, 2, and 4 year old Lake Sturgeon, cleaning tanks and preventing overflows, removing deceased sturgeon from tanks, monitoring tank flows, cleaning and replacing sock filters for water filtration system, and assisting with ongoing experiments.

CT DEEP, MARINE FISHERIES DIVISION
Seasonal Resource Assistant

Old Lyme, CT
September 2015-April 2016

Topic: American Shad and Sturgeon Projects

- Main field duties for American Shad project included seining Connecticut rivers, assessing abundances of all species caught, and collecting Alosines from catches for transportation to the lab. Lab duties for this project included sorting Alosines from bycatch, sorting American Shad (*Alosa sapidissima*), Alewife (*Alosa pseudoharengus*), Menhaden (*Brevortia tyrannus*), and Blueback Herring (*Alosa aestivalis*), counting and measuring Alosines, and pressing and aging scales of American Shad.
- Main field duties for Sturgeon project include gill netting and trawling for, handling, and processing Atlantic and Shortnose Sturgeon, removing and counting non-target species from gill nets, and retrieving data from acoustic receivers. Processing Sturgeon entails measuring and weighing each individual, as well as PIT tagging and genetic sampling fish that were not already tagged. Lab duties include net cleaning and mending, and equipment clean-up.
- Occasional participation on the Long Island Trawl survey was necessary. Duties during participation on this project included setting the trawl net, sorting catches, identifying, measuring, and weighing species in

catches, and clean-up.

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY, UCONN
Research Assistant at Toolik Field Station – Heidi Golden (PI: Linda Deegan, Mark Urban)

North Slope, AK
June-August 2015

Topic: Arctic Grayling Local Adaptation

- Camped at a remote field site in North Slope, Alaska for one week to capture and PIT tag Arctic Grayling during the spawning migration. Fish were captured with fyke nets, weirs, and gill nets. Stayed at Toolik Field Station for the remainder of my employment and traveled to remote sites by truck/hiking or R44 helicopter.
- General field duties included carrying heavy equipment to remote sites (50+ pounds), building antenna arrays on various streams, installing solar panels and marine batteries to power antennas, tuning antennas, installing bear fences, measuring stream discharge, collecting water samples for isotope analysis, installing PT (pressure transducer) loggers and iButtons (temperature loggers), setting and checking fyke nets, seining, angling, and PIT tagging fish. Habitat assessments of three different streams were performed over the course of two weeks and required measurements of stream width (wetted and bank-full/total), thalweg depth, discharge, substrate (using a gravelometer), stream bank characteristics (undercut banks, overhanging vegetation, etc.), riparian vegetation, and YOY abundance. Samples for stream nutrients, invertebrate density and diversity, and chlorophyll were also collected.
- Responsibilities while in camp (Toolik Field Station) included rearing Arctic Grayling young of the year (YOY) in an incubation facility, collecting local zooplankton to feed YOY, preparing equipment for field work (cutting rebar, charging marine batteries, mending nets, and organizing/inventorying equipment), extracting otoliths from small fish (1-3 years old), sanding, polishing, and mounting otoliths, recording and organizing data, and cleaning lab space. Rearing YOY entailed building rearing chambers, performing water changes using water collected and hauled from Toolik Lake, building and stocking a continuous drip feeder, and euthanizing (with Clove oil) and processing (measure, weigh, photograph, and freeze) YOY at the end of the experiment.

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY, UCONN

Storrs, CT

Assistant Researcher in the lab of Dr. Eric Schultz working under doctoral student Jonathan Velotta

Fall 2012-Spring 2015

Topic: Osmoregulation in Landlocked and Anadromous Alewife Populations

- Fieldwork consisted of collecting Alewife population samples from various Connecticut lakes by purse seining. Lab work entailed collecting and processing blood samples via capillary tubes, performing cDNA reverse transcription on RNA samples, performing PCR followed by gel electrophoresis to ensure viability of each cDNA sample, and performing RT-qPCR assays with cDNA samples.

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY, UCONN

Storrs, CT

Independent Undergraduate Researcher in the lab of Dr. Eric Schultz – Funded by a SURF grant

Spring 2014-Spring 2015

Topic: Sodium-Potassium ATPase Isoforms (NKA α 1a and α 1b) in Alewife Gill Tissue

- Research began by constructing and analyzing alignments and phylogenetic trees to select candidate sequences from an existing Alewife transcriptome. Identification of the most probable candidates for NKA α 1a and α 1b required designing sequence specific primers, performing cDNA reverse transcription on RNA samples, using PCR and gel electrophoresis to test viability and specificity of primers, and purifying PCR products for sequencing. Through the use of RT-qPCR to investigate relative gene expression at differing salinities, there is sufficient evidence to indicate the presence of NKA α 1a.
- Thesis paper available at: digitalcommons.uconn.edu/srhonors_theses/418

MYSTIC AQUARIUM RESEARCH AND VETERINARY SERVICES DEPARTMENT

Mystic, CT

Intern under Dr. Mandy Keogh and Dr. Paul Anderson

May-August 2013

Topic: Behavioral and physiological changes in Beluga whales in response to out-of-water events

- Duties associated with the behavioral aspect of this project entailed writing ethograms, collecting and coding video, and quantifying behavioral changes. Responsibilities performed for the physiological portion of this research included processing blood samples by separating plasma and buffy coat from red blood cells, preparing various solutions for assays conducted in the lab, validating an EIA kit to accurately detect Beluga cortisol levels, and running EIAs to investigate Beluga cortisol levels. General tasks and side projects included interacting with trained Beluga whales under the instruction of a trainer to collect blow (mucus from blowhole) samples, organizing and cataloging samples in -80°C freezers, designing

informational guides for adults attending the Arctic Watch Wilderness lodge, and conducting educational sessions for camp groups (6-15 yrs old - topics: becoming a research scientist, Beluga whale biology).

Education

UNIVERSITY OF CONNECTICUT
Master of Science, Ecology and Evolutionary Biology

Storrs, CT
August 2015-Present

UNIVERSITY OF CONNECTICUT
Bachelor of Science, Ecology and Evolutionary Biology
GPA 3.650/4.000; Cum Laude; Honors Program; Leadership Scholarship

Storrs, CT
August 2011-May 2015

Honors and Achievements

UNIVERSITY OF CONNECTICUT LEADERSHIP SCHOLARSHIP
Merit-based award for academic excellence and commitment to promoting interests through leadership

UNIVERSITY OF CONNECTICUT HONORS PROGRAM
Accepted in Spring 2012

STUDENT UNDERGRADUATE RESEARCH FUND (SURF) GRANT
Awarded for Summer 2014
Selected to receive a Named Award: Michael Alpert and Ariana Napier Honors Enrichment Scholarship

OUTSTANDING STUDENT IN ECOLOGY AND EVOLUTIONARY BIOLOGY
Honor based on research thesis presentation, awarded May 2015

Relevant Coursework

Biology of Fishes
Global Sustainable Resources
Animal Physiology

Genetics
Evolutionary Biology
Ecology

Introduction to Conservation Biology
Physiological Ecology of Animals
Statistics I & II

Presentations and Publications

Oral Presentation at the University of Connecticut Biology Department Undergraduate Thesis Symposium (2015)
Investigating the Evolutionary Gain and Loss of Na^+ , K^+ -ATPase "Isoform Switching" in a Euryhaline Fish, the Alewife

Poster Presentation at the University of Connecticut Undergraduate Research Symposium (2015)
Investigating the Evolutionary Gain and Loss of Na^+ , K^+ -ATPase "Isoform Switching" in a Euryhaline Fish, the Alewife

Colby, Rebecca S., "Physiological response to salinity challenge is mediated by Na^+ , K^+ - ATPase "isoform switching" in a euryhaline fish, the Alewife" (2015). Honors Scholar Theses. Paper 418.

Colby, Rebecca S., Velotta, Jonathan P., Schultz, Eric, "The presence and evolution of Na^+ , K^+ - ATPase isoform switching in a euryhaline fish, the Alewife" *in progress*.

Extra-Curricular/ Volunteer Involvement

NATIONAL WILDLIFE SOCIETY, UCONN CHAPTER
Member

Storrs, CT
Fall 2012-Spring 2015

- Club activities included attending educational lectures focused on wildlife and biological topics and educational outings to

Horizon Wings Raptor Rehabilitation Center and Wolf Hollow.

UCONN FORESTRY AND WILDLIFE CLUB

Storrs, CT

Officer: Secretary

Fall 2012-Spring 2015

- Fall semester responsibilities include organizing and leading hikes (sometimes with educational components), planning activities for meetings (selected past activities: fly tying, documentary viewing, survival skills trivia), organizing and effectuating fundraising activities. Spring semester involves conducting maple syrup production: required activities include surveying sugar bush, tree tapping, sap line set-up and maintenance, sap collection and transportation, boiling sap in evaporator, splitting wood, stoking the fire, and filtering and bottling syrup. A special honor was awarded in the Spring 2014: the University of Connecticut produced a video expose about our operation entitled: "Making Maple Syrup the UConn Way" (can be found on YouTube.com).

UCONN WOODSMEN TEAM

Storrs, CT

Athlete

Spring 2014-2015

- All members train and compete in Timbersports events. Events personally completed to date are underhand chop, bow saw, crosscut, axe throw, packboard relay, canoe relay, stock saw, log roll, scoot load, pulp toss, triathlon (skidder tire flip, axe throw, platform bow saw), and fly fishing (controlled casting).

CT DEEP, WILDLIFE DIVISION

Marlborough, CT

Volunteer

Summer 2013-2015

- Monitored White-tailed Deer populations by tracking does and fawns using telemetry, and capturing, measuring, weighing, sexing, and collaring fawns. Monitored Canada Geese populations by capturing, aging, banding, and sexing captured geese.

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY, UCONN

Storrs, CT

Volunteer Teaching Assistant for Field Methods in Fish Biology Class

Summer 2014

- General duties entailed managing gear including nets, floatation devices, and measuring equipment, and collected specimens for educational laboratory sessions. Responsibilities in the field involved teaching and/or overseeing purse seining, beach seining, hoop netting, riffle snorkeling, and proper methods for measuring, weighing, and handling various types of fish.

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES, UCONN

Storrs, CT

Volunteer under doctoral student Jan-Michael Hessenauer

Spring 2013

- Volunteers were tasked with performing electrofishing to survey Large-mouth Bass and Northern Pike in a Connecticut lake, and weighing and measuring collected fish.

LUTZ CHILDREN'S MUSEUM

Manchester, CT

Volunteer

Spring-Summer 2011

- Responsibilities involved assisting in the teaching of classes and educational activities focused on local nature and wildlife.

WOODBIDGE VETERINARY HOSPITAL

Woodbridge, CT

Volunteer

Summer 2010

- Duties entailed assisting in diagnosing patients and observing basic treatment methods, routine procedures (such as teeth cleanings), and a major surgery.