
8 - 11 JAN
2024
7th International
Sea Duck Conference

Table of Contents

Welcome to the 7th International Sea Duck Conference

A Virtual Event
8 – 11 January 2024

Dear Colleagues,

We warmly welcome you to the 7th International Sea Duck Conference, a virtual event! Following the tradition of the previous six conferences, our goal is to provide a forum to discuss science, management, and conservation related to sea ducks and the threats facing their populations. We will draw together sea duck enthusiasts from academia, government agencies, conservation organizations, industry, and communities to discuss our shared interests in sea duck research, conservation, management, and community connections.

After missing the anticipated 2020 conference due to the COVID pandemic, the organizing committee hopes the virtual format will both re-engage with the researchers and wildlife managers who typically attend the conference, while broadening our reach to include the wider sea duck community. This "climate friendly" format is low cost for attendees and sea ducks alike! We have planned a rich and engaging program with lots of opportunities for interaction and networking with real people.

The theme this year is "*Bridging Communities: Human Connections to Sea Ducks*" and our daily foci are:

Day 1: Collaboration & Knowledge: Exploring integrative learning and science.
Day 2: Cultural Connections to Sea Ducks: Linking communities that value sea ducks.
Day 3: Humans in Sea Duck Habitats: Understanding & mitigating unintended impacts.
Day 4: Coexistence & Conservation: Acting for climate change adaptation & resilience.

Each day of the conference will include a combination of plenary speakers, oral presentations, lightning talks, panel discussions, and virtual field trips from around the world. In addition, the Poster Session will be held on Tues, 9 Jan 2024 in the Poster Exhibition Hall; there is a Photo Contest for Attendees; and we are holding the first ever Sea Duck Art Exhibition!

We are excited to share with you our Virtual Venue and look forward to seeing you all in January 2024!

Emily, Kate, Susan, Megan, Dan, and Sam
7th International Sea Duck Conference, Organizing Committee


Steller's Eider
by Robert McBroom

PROGRAM AT A GLANCE

Bridging Communities:
Human Connections to Sea Ducks

	Day 1 **Collaboration & Knowledge:** exploring integrative learning and science	**Day 2** **Cultural Connections to Sea Ducks:** linking communities that value sea ducks	**Day 3** **Humans in Sea Duck Habitats:** understanding and mitigating unintended impacts	**Day 4** **Coexistence & Conservation:** acting for climate change adaption and resilience
Central Time	**MONDAY** **8-Jan-24**	**TUESDAY** **9-Jan-24**	**WEDNESDAY** **10-Jan-24**	**THURSDAY** **11-Jan-24**
10:00	Welcome	**PLENARY** **Joel Heath**	Announcements	Announcements
10:10	**PLENARY** **Kate Martin**		**PANEL DISCUSSION:** **Energy Development**	**PLENARY** **David Douglas**
10:45	Field Trip	Field Trip	Field Trip	Field Trip
11:00	**SCIENCE TALKS**	**SCIENCE TALKS**	**SCIENCE TALKS**	**SCIENCE TALKS**
11:30	*Break*	*Break*	*Break*	*Break*
11.45	**SCIENCE TALKS**	**POSTER SESSION LIVE** *(Poster Hall)*	**SCIENCE TALKS**	**SCIENCE TALKS**
12:30	Field Trip		Field Trip	Field Trip
12:45	**LIGHTNING TALKS**		**LIGHTNING TALKS**	**LIGHTNING TALKS**
13:00	*Break*	*Break*	*Break*	*Break*
13:15	**LIGHTNING TALKS**	**SCIENCE TALKS**	**SCIENCE TALKS**	**SCIENCE TALKS**
13:45	Field Trip	Field Trip	**ART EXHIBITION** *(Art Gallery)*	**PANEL DISCUSSION:** **Boreal Fire**
	POSTER VIEWING	**ROUND-TABLE COMMUNITY ENGAGEMENT** *(Lounge)*		
14:00	**STUDENT MIXER ROUND-TABLES** *(Lounge)*		**RT: SPATIAL ECOLOGY KNOWLEDGE GAPS** *(Lounge)*	**CLOSING REMARKS AWARDS CEREMONY** *(Auditorium)*

All times in Central (CST).
All Presentations are in the Auditorium.
Social Networking, Student Mixer & Round-table Discussions are in the Lounge.
Poster Session Live in the Poster Hall.


Spectacled Eiders
by Ruth Weaver

CONFERENCE SPONSORS

Thank you for your Support!

BOEM
Bureau of Ocean Energy Management

USGS
science for a changing world

Washington Department of FISH and WILDLIFE

DUCKS UNLIMITED

Ducks Unlimited Canada
Conserving Canada's Wetlands


Histrionicus histrionicus
by Lyndsi Harris

ACKNOWLEDGMENTS

The 7th International Sea Duck Conference was made possible by several committees.

Organizing Committee

Emily Silverman
Chair, US Fish and Wildlife Service

Susan De La Cruz
US Geological Survey

Megan Ross
Environment and Climate Change Canada

Kate Martin
Sea Duck Joint Venture

Dan Esler
US Geological Survey

Conference Coordinator
Samantha Richman
US Geological Survey

International Advisory Committee

Tim Bowman
Retired, Sea Duck JV

Jón Einar Jónsson
University of Iceland

DJ Monette
US Fish and Wildlife Service

Grant Gilchrist
Environment and Climate Change Canada

Annie Maliguine
University of Alaska, Fairbanks

Reyd Smith
Carleton University & Environment Canada

Mark Gloutney
Ducks Unlimited Canada

Tori Mezebish Quinn
University of Rhode Island

Ramūnas Žydelis
Ornitela

Scientific Program Committee

Dan Esler
Chair, US Geological Survey

Jón Einar Jónsson
University of Iceland

Susan De La Cruz
US Geological Survey

Ramūnas Žydelis
Ornitela

Tori Mezebish Quinn
University of Rhode Island

Virtual Field Trip Committee

Kate Martin
Sea Duck Joint Venture

Tim Bowman
Retired, Sea Duck Joint Venture

Reyd Smith
Carleton University & Environment and Climate Change Canada

Annie Maliguine
University of Alaska, Fairbanks

Tori Mezebish Quinn
University of Rhode Island

Social Media Team

Annie Maliguine
University of Alaska, Fairbanks

Reyd Smith
Carleton University & Environment and Climate Change Canada

Samantha Richman
US Geological Survey

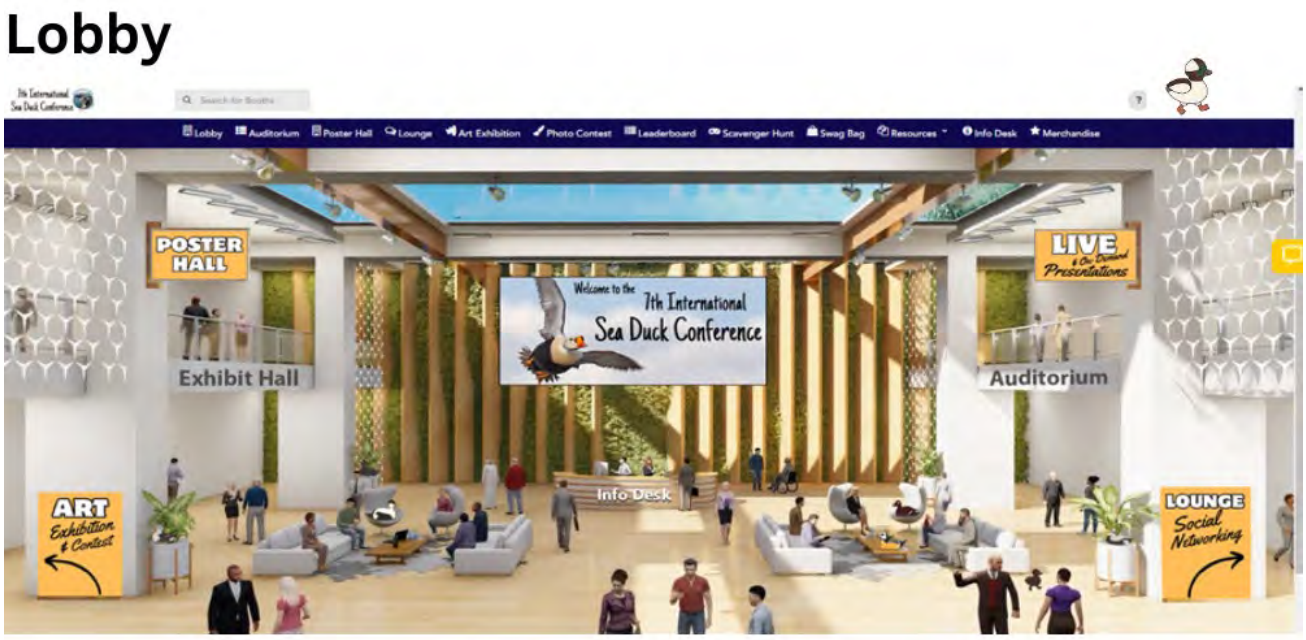

Spectacled Eider Hen Decoy
by Christopher Andrew Nicolai

VIRTUAL VENUE

7th International Sea Duck Conference – website

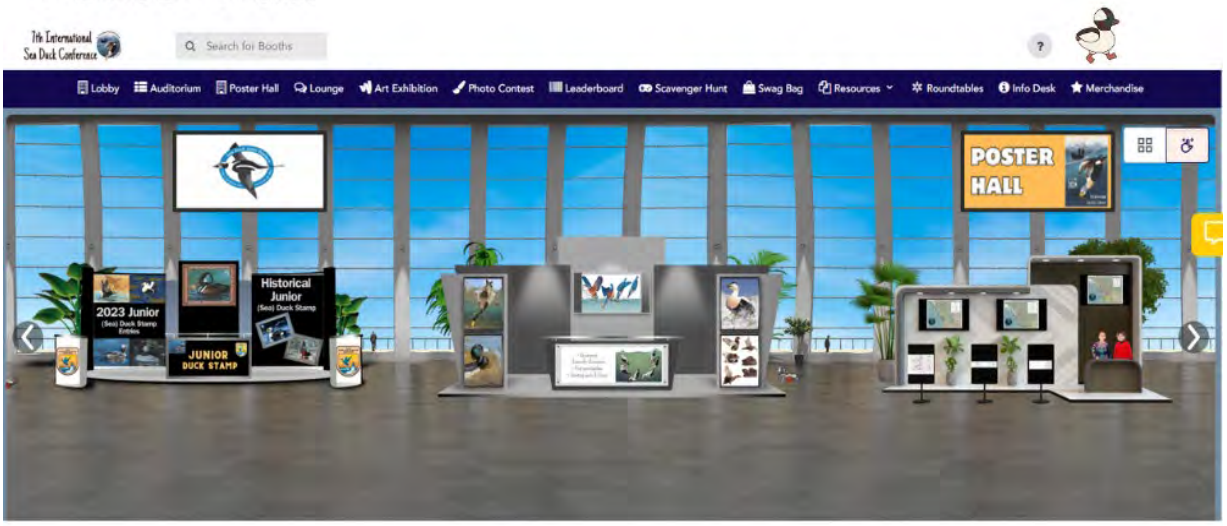
- Login to the Venue using your email and set your password upon first login.
- Watch the welcome video to get a tour of the venue.

- From the **Lobby**, you can reach all rooms in the venue including:
  - **Auditorium:** Live and On-demand presentations
  - **Lounge:** Social Networking and Round-table Discussions
  - **Poster Hall:** Live Poster Session, Tue 9 Jan 2024, 11:45 - 13:15 CST
  - **Art Exhibition:** Art submissions to the contest.
  - **Photo Contest:** Submit a photo in any of the categories:
    - **Up Close**: and personal. Show us those underappreciated angles and details.
    - **On the Wing**: sea ducks in flight
    - **In the Field**: be it field work or recreation, show us your favorite memories.
    - **Field Fails**: things don't always go to plan…
    - **Other**: have something that deserves and entry but doesn't fit above
  - **Leaderboard:** Earn points throughout the venue to win prizes.
  - **Scavenger Hunt:** Find all 41 sea duck images throughout the venue!
    - *You can also download your favorite sea duck image and use it for your profile picture in the upper right corner!*

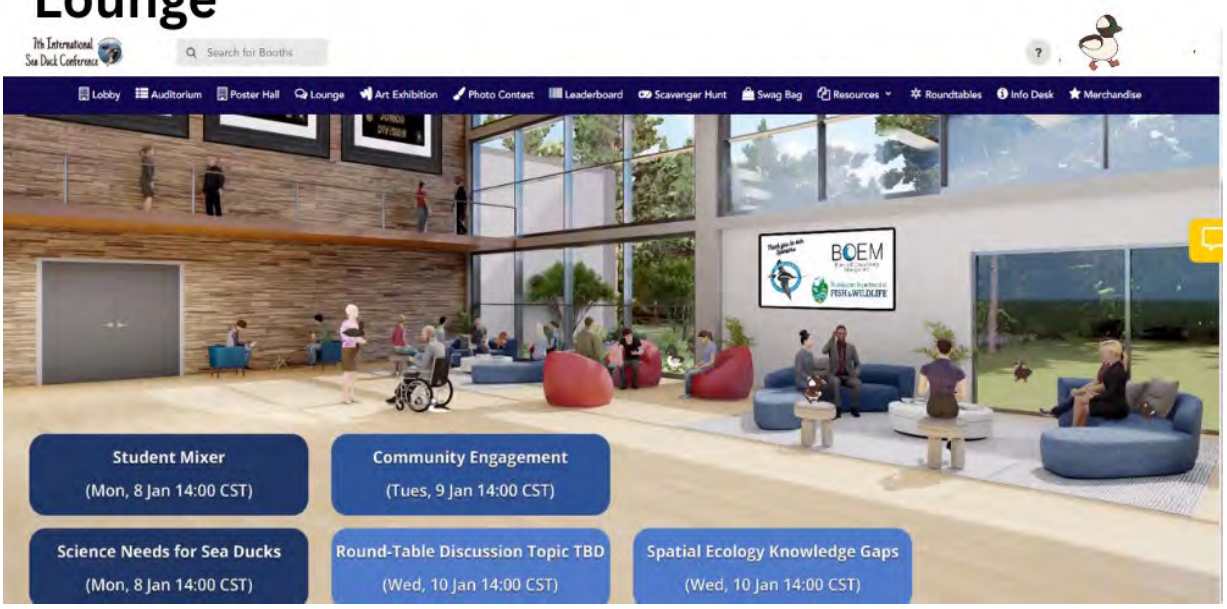


Auditorium

Poster Hall



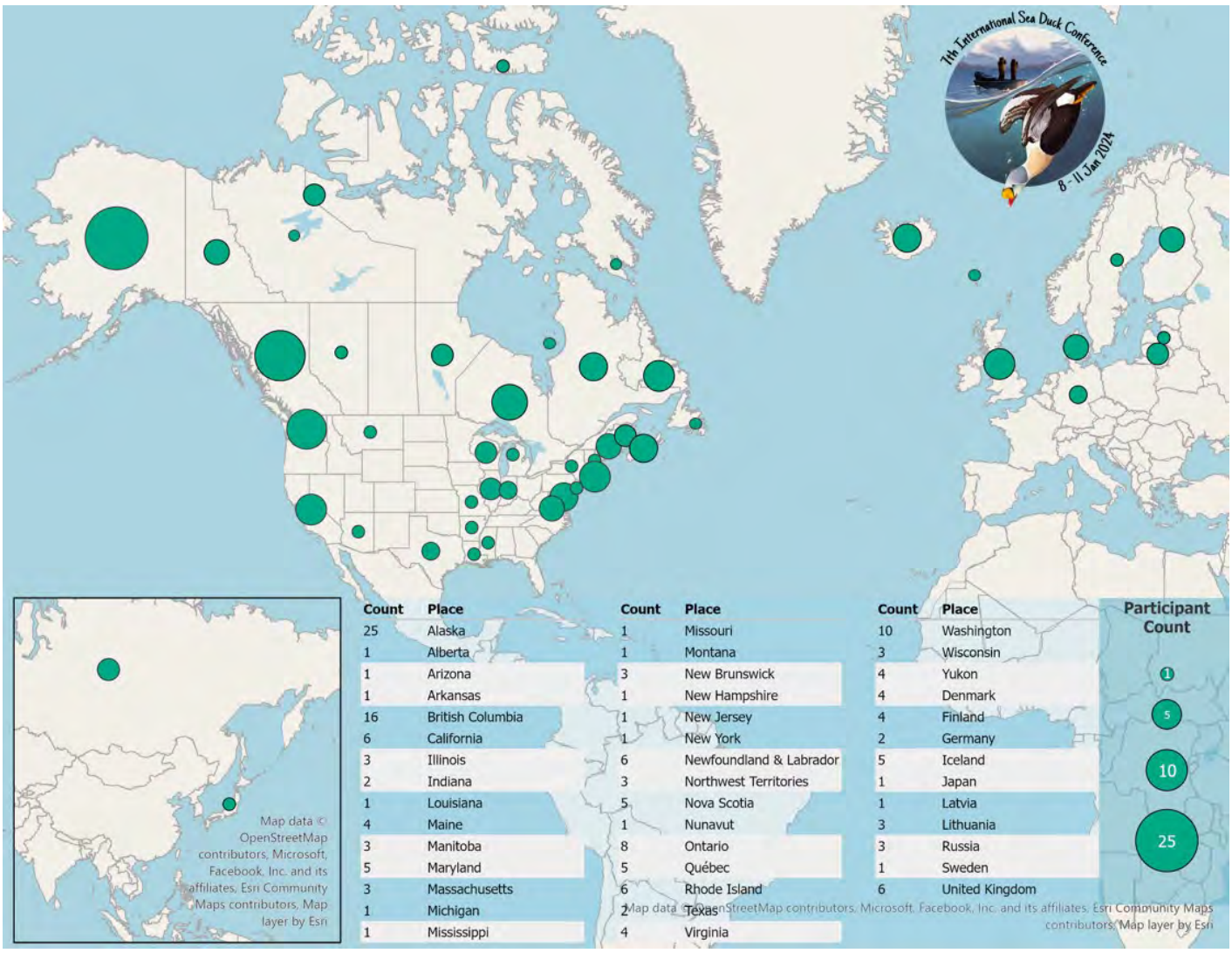
Lounge




Mother Nature's Common Eider
by Emily A.

ATTENDEE STATS

TOTAL REGISTERED	168
General Professionals	132
Students	31
Indigenous Communities*	5
Countries	12



Count	Place	Count	Place	Count	Place
25	Alaska	1	Missouri	10	Washington
1	Alberta	1	Montana	3	Wisconsin
1	Arizona	3	New Brunswick	4	Yukon
1	Arkansas	1	New Hampshire	4	Denmark
16	British Columbia	1	New Jersey	4	Finland
6	California	1	New York	2	Germany
3	Illinois	6	Newfoundland & Labrador	5	Iceland
2	Indiana	3	Northwest Territories	1	Japan
1	Louisiana	5	Nova Scotia	1	Latvia
4	Maine	1	Nunavut	3	Lithuania
3	Manitoba	8	Ontario	3	Russia
5	Maryland	5	Québec	1	Sweden
3	Massachusetts	6	Rhode Island	6	United Kingdom
1	Michigan	2	Texas		
1	Mississippi	4	Virginia		

STUDENT PRESENTATION AWARDS

Student Abstract Awards

Master's Level

- **Emily MacDonald** *(University of Windsor)* SITTING DUCKS: PHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF INCUBATING EIDERS FACING THERMAL STRESS IN THE CANADIAN ARCTIC

- **Olivia Trudeau** *(British Columbia Institute of Technology & Simon Fraser University)* ASSESSING THE ROLE OF OVER-WINTERING MARINE SITES IN SUPPORTING DECLINING SURF SCOTERS (MELANITTA PERSPICILLATA) IN THE SALISH SEA

PhD Candidates

- ***Jesse Kemp*** *(Simon Fraser University) PACIFIC BARROW'S GOLDENEYE REFINE SPRING MIGRATORY PHENOLOGY IN RESPONSE TO ENVIRONMENTAL CONDITIONS*

- ***Tori Mezebish Quinn*** *(University of Rhode Island) MOVEMENT ECOLOGY OF GREATER SCAUP THAT WINTER IN SOUTHERN NEW ENGLAND*

Student Poster Presentation Awards

Winner

- **Elisabeth Knudsen** (University of Iceland) ASSESSING COLOUR VARIATION OF THE COMMON EIDER, SOMATERIA MOLLISSIMA, IN THE FAROE ISLANDS AND ICELAND

Runner Up

- **Shayla Kroeze** (Queen's University) EXAMINING THE DYNAMICS OF CHOLERA IMMUNITY IN COMMON EIDERS IN THE CANADIAN ARCTIC USING WHOLE GENOME ANALYSIS

Student Oral Presentation Awards

Master's Level

- ***Asha Grewal (****Acadia University)* ESTIMATING NESTING STATUS OF PTT-EQUIPPED AMERICAN COMMON EIDER HENS TO DETERMINE BREEDING PROPENSITY

Runners-Up

- **Randall Friendly** (University of Alaska, Fairbanks) CROSS-SEASONAL EFFECTS IN A SEA ICE-ASSOCIATED SEA DUCK: DO WINTER CONDTIONS AFFECT BREEDING SPECTACLED EIDERS?

- **Emily MacDonald** *(University of Windsor)* SITTING DUCKS: PHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF INCUBATING EIDERS FACING THERMAL STRESS IN THE CANADIAN ARCTIC

PhD Candidates

Winner

- ***Dr. Alex Nicol-Harper*** *(University of South Hampton)* VITAL RATES OF NON-BREEDERS AND RETURNING BREEDERS STRONGLY INFLUENCE POPULATION DYNAMICS FOR THE COMMON EIDER

Runner Up

- ***Jesse Kemp*** *(Simon Fraser University)* *PACIFIC BARROW'S GOLDENEYE REFINE SPRING MIGRATORY PHENOLOGY IN RESPONSE TO ENVIRONMENTAL CONDITIONS*

ART EXHIBITION & CONTEST

Art Organizing Committee

Megan Ross
Environment and Climate Change Canada

Emily Silverman
US Fish and Wildlife Service

Samantha Richman
US Geological Survey

Art Evaluation Panel

Sara Adlerstein, *Artist, Aquatic Ecologist, University of Michigan*

Sara is an applied aquatic ecologist, visual artist and curator. She obtained a MS at the University of Concepcion Chile and a PhD at the University of Washington. She has been painting for as long as she has been a scientist. Her art has been published in books and magazines, shown in galleries and museums in Chile, Europe, Canada, and the US and are part of public and private art collections. She is currently a member of the Ann Arbor WSG Gallery and an Associate Research Scientist and Lecturer in the School for Environment and Sustainability (SEAS).

Steve Dudley, *Avid Collector of Wildlife Art, Retired, British Ornithological Union*

Steve was the British Ornithological Union (BOU) Chief Operations Officer, responsible for the day to day running of all BOU activities, until July 2022. Now a full-time birder and avid collector of wildlife art, Steve was quite good at art at high school, his successful exam piece was of a Black-winged Stilt after which he went on to study graphic design. He designed the BOU's Janet Kear Union Medal in 2019 which he himself was awarded by the BOU in 2023. He is avid collector of bird and wildlife art.

DJ Monette, *Native American Liaison Advisor, US Fish and Wildlife Service*

DJ Monette currently serves as the Associate Native American Liaison Advisor under the National Native American Program for the U.S. Fish and Wildlife Service. DJ has nearly 30 years of experience working with Tribes - 4 1/2 years with the San Carlos Apache Tribe located in East Central Arizona and 25 years (of which about 23 years serving in a Tribal liaison capacity role) with the U.S. Fish and Wildlife Service. DJ has 3 adult children and 3 grandchildren and loves playing hockey, fishing and hiking and being outdoors.

Walt Rhodes, *Wildlife Biologist & Pilot, US Fish and Wildlife Service*

Hailing from an island in the Chesapeake Bay region, waterfowl have been a part of Walt's life from a young age. After completing a master's degree on canvasbacks, he has been involved with migratory-bird management over a 30-plus-year career. He currently serves as a pilot-biologist for the U.S. Fish and Wildlife Service, where his primary duties include flying migratory-bird surveys, banding crew leader, wingbee checker, and scientific advisor for the judges of the annual Federal Duck Stamp contest.

Mesha Wood, *Junior Duck Stamp Coordinator, Ridgefield National Wildlife Refuge Complex*

Mesha Wood is a Park Ranger for the Ridgefield National Wildlife Refuge Complex in SW Washington. Supporting visitor services, Mesha uses her background in graphic design and marketing to create signage, develop social media and web content, and create visual communication and educational materials for the complex. Additionally, she teaches design workshops for the USFWS National Conservation Training Center and serves as the Junior Duck Stamp Coordinator for Washington State.

A note from the Art Exhibition judges….

The Sea Duck Art Competition ran as part of the 7th International Sea Duck Conference and attracted 101 entries submitted by artists from 8 countries. The breadth of subject and diversity of mediums submitted reflects our shared interests in sea ducks and the cultural connections between those in the creative arts and those in the scientific community who study them. As organizers of the first ever Sea Duck Art Exhibition, we are humbled by how these two worlds have come together.

Submissions were sent in as photos or digital versions of the artwork and randomly assigned an entry number. Five judges viewed all submissions anonymously and selected their top 20 submissions. Submissions receiving at least two nominations went forward. The resulting 32 pieces were then reviewed in detail by the judges who ranked their top 20 pieces and again returned their ranks blind to the competition coordinator. From the combined ranks an overall ranking (1-32) was arrived at, forming the basis of a two-hour online meeting held on December 21st. This meeting proved both invaluable and instructive, as the judges discussed the highest-ranking submissions in at times forensic detail to arrive at their final decision to award the winner, runner-up and 9 honourable mentions.

Art is many different things to different people. And that's exactly why competitions such as this have a judging panel drawn from different backgrounds and interests to better represent the wider community. We try to stay clear of categorizing artwork as good or bad. Interesting art should however go beyond the depiction of a subject. Interesting art tells a story; it provides a sense of space and understanding of a subject within its natural environs; it draws in the viewer; and it elicits emotion from them. The judges feel that both the winner and runner-up entries do all of these things. They not only depict their subjects brilliantly, but they both provide the viewer with a sense of place which instantly draws emotion from them. Each piece depicts and opens up a world that many of us haven't encountered or an experience we don't usually get to see.

Winners will be announced on Thursday, 11 January 2024 during the Conference Closing Ceremony as well as posted on the 7ISDC Instagram Account @SeaDuckConference #7ISDCArtExhibition

We hope that you enjoy these winning pieces, the 9 honourable mentions selected, and all the other fabulous submissions, as much as we've enjoyed viewing and critiquing them.

Steve Dudley
on behalf of the judging panel

ART CONTEST WINNERS

WINNER

Deep Dive by Rebekah Knight

www.rebekahknight.com
@reb.knight.art

Description: This painting is done in oil on canvas (11" x 14"). It features a king eider taking a deep dive into the water to find food.

Judges' Comments: The judges selected this piece as the winning entry partly due to the bravery of the artist in depicting the unseen world of a sea duck. Being the only underwater subject submitted, it was a unique entry. The diving King Eider is brilliantly executed, slightly unsharp due to viewing through water and the movement of the bird. The altering light depicting the deepening water, the angle of the bird, the escaping bubbles, are just all utterly believable and provide a wow! piece of artwork.

RUNNER-UP

Harlequin Creek
by Michael Patrick Bailey

https://michaelpatrickbailey.com/
@michaelpatrickbailey

Description: I had the fortune of seeing some work from the Hudson River School, and wanted to have that influence a piece of my own in a small way, particular the way they take on values of their subjects, but with a color palette that is more my own. After getting the chance to see Harlequin duck study skins up close on a research trip to the Natural History Museum of Los Angeles County, I knew what the subject should be.
'Harlequin Creek' features a Harlequin duck drake standing like a tiny sentry, watching the water crash past him, while his cohort naps, preens, and suns safely from predators in the middle of the rushing creek, a misty fall stands beyond. This painting is 15 in x 20 in, rendered in oil on illustration board.

Judges' Comments: This piece was selected as runner-up because of the beautiful depiction of the sense of place and it captures perfectly the harsh environment Harlequin Ducks choose to breed. Once judge commented "it feels as we were there to share the moment" and another that the birds and their surrounds were "rendered just as you'd view them from a distance, slightly unresolved and not feather detail".

HONOURABLE MENTIONS

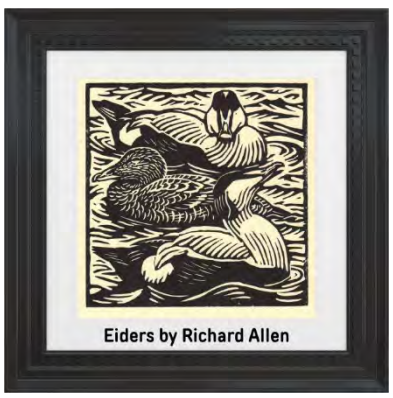

Goldeneye Duck
by Clint Eagar


Long-tailed Duck
by Raymond Easton


Barrow's Goldeneye
by Rebekah Knight


Red Breasted Merganser at Point
Lobos by Robert Steiner


Red-breasted Merganser
by Robert McBroom


Eiders by Richard Allen


Arctic Royalty
by Cynthia Fisher

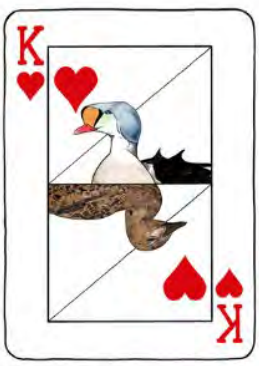

Steller's Eider
by Robert McBroom


Bufflehead Duck
by Clint Eagar

SEA DUCK SCAVENGER HUNT

Scattered throughout the virtual venue are sea duck art submitted by several artists. Click on them to earn points for the Leaderboard!

Spicy Merg
by Addie Willsrud



Royalty
by Addie Willsrud

Ducks in Line
by Carolina Serrano

Felt Harlequin
by Monica Zalog

King Eider
by Sarah Mitchell

SEE BC SEA DUCKS
by Chloe Lemay

SEA DUCKS
by Jacey Wall


Feathers to Beads
by Veronica K.

PLENARY SPEAKERS

Monday, 8 Jan 2024 @ 10:15 CST

THE SEA DUCK JOINT VENTURE PARTNERSHIP:

ADDRESSING KNOWLEDGE GAPS THROUGH LARGE-SCALE COLLABORATIONS

Kate H. Martin, Margaret Campbell, Ken D. Richkus, Al R. Hanson, David E. Safine, and Shannon S. Badzinski

KHM: Sea Duck Joint Venture, US Coordinator, U.S. Fish and Wildlife Service, Anchorage, Alaska, USA; kate_martin@fws.gov
MC: Sea Duck Joint Venture, Canada Coordinator, Canadian Wildlife Service, Whitehorse, Yukon, Canada
KDR: Sea Duck Joint Venture Management Board Co-Chair, U.S. Fish and Wildlife Service, Falls Church, Virginia, USA
ARH: Sea Duck Joint Venture Management Board Co-Chair, Canadian Wildlife Service, Sackville, New Brunswick, Canada
DES: Sea Duck Joint Venture Continental Technical Team Co-Chair, U.S. Fish and Wildlife Service, Anchorage, Alaska, USA
SSB: Sea Duck Joint Venture Continental Technical Team Co-Chair, Canadian Wildlife Service, Ottawa, Ontario, Canada

An increased awareness of sea duck population declines and the paucity of data on basic sea duck ecology spurred the creation of the Sea Duck Joint Venture (SDJV) in 1999 under the auspices of the North American Waterfowl Management Plan. The SDJV is a self-directed partnership co-chaired by the U.S. Fish and Wildlife Service and Canadian Wildlife Service and includes members from federal, state/provincial, and non-governmental organizations in the U.S. and Canada. The SDJV works with partners to develop, fund, and communicate the results of research and monitoring that addresses information gaps related to the management and conservation of North American sea ducks. Through supporting over 170 research projects to date, the SDJV has delineated populations, identified population-limiting factors, and characterized migratory routes and important habitats for several species. Over time, the focus of the SDJV has evolved from resolving basic ecological questions to prioritizing work explicitly linked to conservation and management actions. The SDJV has provided guidance on monitoring priorities and sea duck harvest sustainability and developed survey methods including improved species detection and identification techniques. More recently, the SDJV developed the Sea Duck Key Habitat Sites Atlas that identifies 85 sites most critical to sea duck populations in North America to aid in habitat protection, marine spatial planning, and environmental assessments. In addition, the SDJV Student Fellowship Program supports early career biologists contributing to sea duck research and conservation. We briefly describe the SDJV partnership, the priorities set in the 2022 SDJV Strategic Plan, and the process for soliciting and selecting projects for SDJV funding. We highlight recent SDJV-supported research contributing to the science and management of sea ducks, describe information gaps and priorities that we hope to address in the future, and provide tips to improve the competitiveness of proposals and fellowship applications submitted to the SDJV

PLENARY SPEAKERS
Tuesday, 9 Jan 2024 @ 10:05 CST

CREATING AN INUIT-LED PROTECTED AREA FOR QIKIQTAIT: THE BELCHER ISLANDS ARCHIPELAGO

Joel P. Heath and Lucassie Arragutainaq

JPH, LA: The Arctic Eider Society, Sanikiluaq, NU, Canada; joel.heath@arcticeider.com
LA: Sanikiluaq Hunters and Trappers Association, Sanikiluaq, NU, Canada

Qikiqtait (the Belcher Islands) archipelago located in the heart of Hudson Bay home to the unique Hudson Bay Common Eider subspecies. The community of Sanikiluaq is working to create an Indigenous-led marine and terrestrial protected area that will protect a variety of key species including protecting eiders throughout their annual cycle, given this species does not migrate. Sanikiluaq has a unique relationship with eiders as showcased in their film People of a Feather. The Arctic Eider Society is an Inuit-led registered charity based in Sanikiluaq and is supporting implementing this vision through a whole-of-community approach. This talk will highlight recent capacity building for infrastructure and community-driven research and monitoring, including the use of SIKU: The Indigenous Knowledge Social Network, a mobile app and project management platform created by AES and used to crowd-source a resource inventory for Qikiqtait, as well as being used across the north by Indigenous communities in Canada, Alaska and Greenland.

PLENARY SPEAKERS
Thursday, 11 Jan 2024 @ 10:10 CST

LONG-TERM ENVIRONMENTAL DATA:

WHERE TO GET THEM AND WHAT TO LOOK FOR

David Douglas

DD: US Geological Survey Alaska Science Center, Anchorage, AK, USA; ddouglas@usgs.gov

The ability to acquire long-term environmental data at specific areas and on specific dates has become remarkably efficient over the past decade. A growing number of servers are providing end-users with tools that deliver spatial, temporal, and thematic subsets of long-term global datasets that are often too large to download in their entirely. Three sources that I have found to be especially useful are: 1) Europe's Copernicus services (https://www.copernicus.eu/); 2) NOAA Coastwatch's ERDDAP interfaces (https://coastwatch.pfeg.noaa.gov/erddap/); and 3) Movebank's Env-DATA tool (https://www.movebank.org/). Popular long-term ocean data include metrics such as sea surface temperature, productivity (Chl-a), currents and sea ice, while several global reanalysis data sets provide a variety of high temporal frequency (1–6 hour) weather variables such as air temperature, wind, precipitation, and snow. The weather and sea surface temperature data date back to the 1980s or earlier while most other ocean metrics commence around the year 2000. As climate warming imposes a new era of unprecedented environmental disequilibrium, it is crucial to better understand how species, food webs, and ultimately ecosystems will respond if science is to have an effective role in adaptation. Analyzing species responses to contemporary environmental conditions, and with respect to conditions of prior decades, will help formulate important mechanistic hypotheses that future studies can test, refine, and ultimately use for developing adaptation strategies.


Deep Dive by Rebekah Knight

PANEL DISSCUSSIONS

Wednesday, 10 January 2024 at 10:10 CST

ENERGY DEVELOPMENT IN SEA DUCK HABITATS

Development of offshore renewable energy and oil and gas resources is occurring in coastal sea duck habitats across the northern hemisphere and is predicted to increase in scope in the coming years. This session will feature short interviews with panelists familiar with energy development activities in their region and how related activities intersect with sea duck populations. Experts will be asked to provide their views on the most pressing sea duck information needs in light of on-going and anticipated future energy development in the marine environment.

Panelists:

David Pereksta
Marine Biologist
Bureau of Ocean and Energy Management

Kate Williams
Director of Wildlife and Renewable Energy Program
Biodiversity Research Institute

Pam Loring
Wildlife Biologist
US Fish and Wildlife Service

Georg Nehls
Managing Director
Bioconsult SH, Germany

Scott Johnston
Wildlife Biologist
US Fish and Wildlife Service

PANEL DISSCUSSIONS

Thursday, 11 January 2024 at 13:45 CST

FIRE AND CLIMATE CHANGE IN THE BOREAL FOREST

Wildfires are the principal disturbance in the boreal forest, but previous work suggests that many boreal nesting species, including waterfowl, are largely resilient to forest fires. However, given the unprecedented fires that affected most of the provinces and territories of Canada during 2023 and predictions that fire size and frequency will increase as the climate warms, it is unclear how future fire may influence boreal habitat and the waterfowl species that rely on it. Dr. Fritz Reid will update us on the effects of recent fires and climate projections for the boreal forest. Chief Steve Nitah will share how Indigenous communities in the boreal are working to include traditional knowledge in forest conservation and management to increase resilience to fire. Bring your questions for a follow up discussion on fire, and climate change and sea duck conservation in the changing boreal landscape.

Chief Steve Nitah
Managing Director for Nature4Justice Canada
Steve is a past Chief and Negotiator for the Akaitcho peoples in the NWT. Steve was instrumental in negotiating terms for the Thedenene Indigenous Protected and Conserved Area and has been involved in Indigenous Guardians programs in Canada.

Fritz Reid
Senior Advisor for Boreal and Arctic Conservation, Ducks Unlimited, Inc.
Fritz has worked for DU on waterfowl habitat conservation across the Pacific Flyway, the boreal forest and many other regions worldwide for more than three decades. He has been a leader in boreal conservation throughout his career, forging partnerships that will ensure over 1 billion acres of boreal forest will be conserved into the future.

ROUND-TABLE DISCUSSIONS

Social networking opportunities in the Lounge on several important topics! Grab your seat at the table to join in!

Monday, 8 January 2024 at 14:00 CST

Round-table: Student Mixer

Host: *Tori Mezbish-Quinn, PhD candidate, University of Rhode Island*
A casual meet-and-greet for students.

Science Needs for Sea Ducks

Host: *Kate Martin, Sea Duck Joint Venture*

Tuesday, 9 January 2024 at 14:00 CST

Round-table: Community Engagement

Host: *Megan Ross, Environment and Climate Change Canada*
What communities should be more involved in sea duck conservation, monitoring, and research and how do we engage them?

Round-table: Social Networking

Wednesday, 10 January 2024 at 14:00 CST

Round-table: Spatial Ecology Knowledge Gaps

Host: *Dan Esler, US Geological Survey*
SDJV has invested heavily in understanding sea duck spatial ecology, particularly in defining population delineation and identifying key habitats. What gaps remain in fulfilling these goals? Are there particular species, subpopulations, or areas that need additional attention?

VIRTUAL FIELD TRIPS

The International Sea Duck Conference typically attracts participants from around the world that study and manage sea ducks in a variety of habitats that have unique characteristics and different management opportunities and challenges. We asked sea duck researchers to produce "virtual field trips" that highlight these unique sea duck habitats so conference participants can be more familiar with important sea duck habitats around the globe. Field trip videos in the program included:

Monday, 8 January 2024

Where Have All the Eiders Gone? Uncovering the Journey of Atlantic Common Eiders: Field Methods by Scott Gilliland, Nic McLellan, Jodie Hambrook, Kate Martin and Emile David

Scaly-sided Merganser Research in Primorye, Russia by Diana Solovyeva

Sea Ducks of the Chaun Delta, Russia by Diana Solovyeva and Olga Propopenko

Tuesday, 9 January 2024

Gitdisdzu Lugyeks (Kitasu Bay) Marine Protected Area by The Kitasoo Xai'xais Nation

Saving a sea duck known as Ol'Skunkhead (SALISH SEA WILD) by SeaDoc Society

Rivière-du-loup – Bas-Saint-Laurent: Wild and magnificent islands in the St-Lawrence River by Societe Duvetnor, un projet de conservation et de mise en Valeur

Wednesday, 10 January 2024

The Indigirka Delta, Russia by The Wildlife Conservation Society

Long-tailed Ducks of Nantucket Sound and Shoals by Tori Mezebish Quinn and Glenn Olsen

Thursday, 11 January 2024

Research in a Changing Arctic: 30 years of studying eider ducks and community ecology at East Bay, in the Canadian Arctic by Grant Gilchrist, Oliver Love, Reyd Smith, Christina Semeniuk, and Holly Hennin

Sea Ducks and the Yukon-Kuskokwim Delta by Tim Bowman

CONFERENCE LOGO ARTIST

Kirsty Yeomans, Crow Artist

Kirsty lives in the United Kingdom and has a special talent for creating illustrations of bird behaviors in their natural habitats. She has a unique ability to breathe life into birds to bring out their hidden personalities with a passion to cross realism with caricature.

Please visit Kirsty's website Crow Artist and Etsy Shop to view her other work.


Harlequin Creek
by Michael Patrick Bailey

PROGRAM

MONDAY, 8 JANUARY 2024

10:00 - 14:00 CST			**COLLABORATION & KNOWLEDGE: EXPLORING INTEGRATIVE LEARNING AND SCIENCE**
9:30			Auditorium OPEN for LIVE STREAMING
10:00		Emily Silverman	**WELCOME TO THE 7TH INTERNATIONAL SEA DUCK CONFERENCE**
10:15 - 10:45	***A1***	**Plenary:** Kate Martin	**THE SEA DUCK JOINT VENTURE PARTNERSHIP: ADDRESSING KNOWLEDGE GAPS THROUGH LARGE-SCALE COLLABORATIONS - Kate H. Martin**, Margaret Campbell, Ken D. Richkus, Al R. Hanson, David E. Safine, and Shannon S. Badzinski
10:45	***A2***	Field Trip	**WHERE HAVE ALL THE EIDERS GONE? UNCOVERING THE JOURNEY OF ATLANTIC COMMON EIDERS: FIELD METHODS -** Scott Gilliland, Nic McLellan, Kate Martin, Jodie Hambrook, and Emile David
11:00	***A3***	Juliet Lamb	**EVALUATING CONSERVATION UNITS AT THE CONTINENTAL SCALE USING NETWORK ANALYSIS: A SEA DUCK CASE STUDY - Juliet S. Lamb,** Clara Cooper-Mullin, Scott G. Gilliland, Alicia M. Berlin, Timothy D. Bowman, W. Sean Boyd, Susan E.W. De La Cruz, Daniel Esler, Joseph R. Evenson, Paul Flint, Christine Lepage, Dustin E. Meattey, Jason E. Osenkowski, Peter W.C. Paton, Matthew C. Perry, Dan Rosenberg, Jean-Pierre L. Savard, Lucas Savoy, Jason Schamber, David. H. Ward, John Y. Takekawa, and Scott R. McWilliams
11:15	***A4***	Alex Nicol-Harper*	**VITAL RATES OF NON-BREEDERS AND RETURNING BREEDERS STRONGLY INFLUENCE POPULATION DYNAMICS FOR THE COMMON EIDER - Alex Nicol-Harper,** Kevin A. Wood, Geoff M. Hilton, C. Patrick Doncaster, and Thomas H. G. Ezard
11:30 - 11:45			***Coffee Break (15 min)***
11:45	***A5***	Mark Koneff	**REMOTE SENSING FOR BROAD-SCALE POPULATION SURVEYS OF SEA DUCKS: PROGRESS AND CHALLENGES - Mark D. Koneff**, Bradley A. Pickens, Ryan C. Dotson, Timothy P. White, Kyle L. Landolt, Luke J. Fara, Aaron C. Murphy, and Jennifer J. Dieck
12:00	***A6***	Kristin Bianchini	**INSIGHTS INTO THE BREEDING DISTRIBUTION AND CHRONOLOGY OF NORTH AMERICAN SCOTERS FROM SATELLITE TELEMETRY DATA - Kristin Bianchini,** Scott G. Gilliland, Alicia M. Berlin, Tim D. Bowman, W. Sean Boyd, Susan E.W. De La Cruz, Dan Esler, Joseph R. Evenson, Paul L. Flint, Christine Lepage, Scott R. McWilliams, Dustin E. Meattey, Jay E. Osenkowski, Matthew C. Perry, Jean-François Poulin, Eric T. Reed, Christian Roy, Jean-Pierre L. Savard, Lucas Savoy, Jason L. Schamber, Caleb S. Spiegel, John Takekawa, David H. Ward and Mark L. Mallory

MONDAY, 8 JANUARY 2024			
12:15	***A7***	Kyle Landolt	**AUTOMATING THE DETECTION AND CLASSIFICATION OF SEA DUCKS AND OTHER WILDLIFE IN AERIAL IMAGERY WITH MACHINE LEARNING METHODS - Kyle Landolt,** Tim White, Mark Koneff, Brad Pickens, Aaron Murphy, Matthew Walker, Jennifer Dieck, Luke Fara, Dave Fronczak, and Stella Yu
12:30	***A8***	Field Trip	**SCALY-SIDED MERGANSER RESEARCH IN PRIMORYE, RUSSIA -** Diana Solovyeva
12:35 - 13:00		**LIGHTNING TALKS**	
12:35	***A9***	David Bradley	**ENGAGING A TRANSBOUNDARY EXPERT NETWORK TO PRIORITIZE COASTAL AND MARINE HABITAT MANAGEMENT FOR SEA DUCKS IN THE SALISH SEA - David Bradley** and Danielle Ethier
12:40	***A10***	Julia Baak	**SEA DUCK AND SEABIRD MONITORING IN THE CANADIAN ARCTIC - Julia E. Baak**
12:45	***A11***	Jacob Hewitt*	**A PHOTO SURVEY TO ESTIMATE ANNUAL RECRUITMENT IN ATLANTIC FLYWAY SEA DUCK POPULATIONS - Jacob Hewitt,** Jason N. Straub, Anthony J. Roberts, and Kelsey Sullivan
12:50	***A12***	Iben H. Sørensen	**CAN STUDIES OF BREEDING SUCCESS AND MIGRATION ROUTES EXPLAIN THE RECENT DECLINES OF COMMON EIDER, VELVET SCOTER AND RED-BREASTED MERGANSER IN THE BALTIC SEA? -** Fredrik Haas, Niklas Liljebäck, Johan Månsson, Ib K. Petersen, Jacob Sterup, Adam Stålnäbb and **Iben H. Sørensen**
12:55			**LIGHTNING Q&A**
13:00 - 13:15			***Coffee Break (15 min)***
13:15 - 13:45		**LIGHTNING TALKS**	
13:15	***A13***	Jesse Kemp*	**PACIFIC BARROW'S GOLDENEYE REFINE SPRING MIGRATORY PHENOLOGY IN RESPONSE TO ENVIRONMENTAL CONDITIONS - Jesse Kemp**, W. Sean Boyd, Tesia M. Forstner, Daniel Esler, Timothy D. Bowman, David C. Douglas, Danica Hogan, Malcolm McAdie, Jonathan E. Thompson, Megan Willie, and David J. Green
13:20	***A14***	Shawn Craik	**CONSPECIFIC BROOD PARASITISM IN RED-BREASTED MERGANSERS: PARASITE BEHAVIOR AND HOST FITNESS COSTS - Shawn R. Craik** and Rodger D. Titman

MONDAY, 8 JANUARY 2024			
	13:25	***A15*** Riley Porter*	**NEST BOX SELECTION BY BREEDING COMMON GOLDENEYE (BUCEPHELA CLANGULA) IN THE CHENA RIVER SYSTEM, INTERIOR ALASKA - Riley Porter**, J. Brian Davis, Melanie Boudreau, Guiming Wang, and Eric Taylor
	13:30	***A16*** Jacob Kraemer	**SEA DUCK RESEARCH OPPORTUNITIES AND RESOURCES AT PINOLA CONSERVANCY - Jacob S. Kraemer**
	13:35		**LIGHTNING Q&A**
	13:40	***A17*** Field Trip	**SEA DUCKS OF THE CHAUN DELTA - RUSSIA -** Diana Solovyeva and Olga Propopenko
	13:45		**POSTER VIEWING (Poster Hall)**
	14:00	Round Tables	**STUDENT MIXER** – Host: Tori Mezbish Quinn (U Rhode Island) **SCIENCE NEEDS FOR SEA DUCKS** – Host: Kate Martin (SDJV) *(Lounge/Roundtable)*
	14:30		**End of live stream in Auditorium**

*Student Presenter

TUESDAY, 9 JANUARY 2024			
10:00 - 14:00 CST			**CULTURAL CONNECTIONS TO SEA DUCKS: LINKING COMMUNITIES THAT VALUE SEA DUCKS**
9:45			**Live Streaming in the Auditorium**
10:00		Emily Silverman	**OPENING REMARKS & ANNOUNCEMENTS**
10:10 - 10:45	***B1***	**Plenary:** Joel Heath	**CREATING AN INUIT-LED PROTECTED AREA FOR QIKIQTAIT: THE BELCHER ISLANDS ARCHIPELAGO - Joel P. Heath** and Lucassie Arragutainaq
10:45	***B2***	Field Trip	**GITDISDZU LUGYEKS (KITASU BAY) MARINE PROTECTED AREA** - Kitasoo Xai'xais Nation
11:00	***B3***	Field Trip	**SAVING A SEA DUCK KNOWN AS OL'SKUNKHEAD (SALISH SEA WILD)** - SeaDoc Society
11:15	***B4***	Sarah E. Gutowsky	**RANGE-WIDE SPATIAL PATTERNS IN TRENDS AND DISTRIBUTION OF WINTERING AMERICAN COMMON EIDER FROM AERIAL SURVEYS, CITIZEN SCIENCE, AND SATELLITE TELEMETRY - Sarah E. Gutowsky**, Mark L. Mallory, Gregory J. Robertson, Nic R. McLellan, Alan Hanson, Scott G. Gilliland
11:30 - 11:45			***Coffee Break (15 min)***
11:45 - 13:00			**POSTER SESSION LIVE - in the Poster Hall**
13:00 - 13:15			***Coffee Break (15 min)***
13:15	***B5***	Julius Morkūnas	**DIVING ACTIVITY OF WINTERING VELVET SCOTERS (*MELANITTA FUSCA*) IN THE EASTERN BALTIC SEA - Julius Morkūnas,** Paola Forni, Rasa Morkūnė, and Ramūnas Žydelis
13:30	***B6***	Asha Grewal*	**ESTIMATING NESTING STATUS OF PTT-EQUIPPED AMERICAN COMMON EIDER HENS TO DETERMINE BREEDING PROPENSITY - Asha C. Grewal,** Mark L. Mallory, Scott Gilliland, Nic McLellan, Greg Robertson, Frances E. Buderman, Al Hanson, and Sarah E. Gutowsky
13:45	***B7***	Field Trip	**Rivière-du-loup – Bas-Saint-Laurent: Wild and magnificent islands in the St-Lawrence River** by Societe Duvetnor, un projet de conservation et de mise en Valeur
14:00		Round Tables	**COMMUNITY ENGAGEMENT** – Host: Megan Ross **SOCIAL NETWORKING** *(Lounge/Roundtable)*
14:30			**End of live stream in Auditorium**

WEDNESDAY, 10 JANUARY 2024

10:00 - 14:00 CST			**HUMANS IN SEA DUCK HABITATS: UNDERSTANDING AND MITIGATING UNINTENDED IMPACTS**
9:30			**Live Streaming in the Auditorium**
10:00		Emily Silverman	**OPENING REMARKS & ANNOUNCEMENTS**
10:10 - 10:30	***C1***	Martin	**PANEL DISCUSSION: ENERGY DEVELOPMENTS IN SEA DUCK HABITATS - Kate H. Martin, David Pereksta, Kate Williams, Pam Loring, Scott Johnston, and George Nehls**
10:30	***C2***	Field Trip	**THE INDIGIRKA DELTA -** Wildlife Conservation Society
10:45	***C3***	Kate Williams	**GUIDANCE FOR DETECTING CHANGES IN MARINE BIRD DISTRIBUTIONS AND HABITAT USE RELATED TO OFFSHORE WIND DEVELOPMENT IN THE UNITED STATES - Kate Williams,** Julia Gulka, Iain Stenhouse, Holly Goyert, Edward Jenkins, Kate McClellan Press, Caleb Spiegel, and Tim White
11:00	***C4***	Kelly Kapsar	**QUANTIFYING RISK OF VESSEL ENCOUNTERS WITH SEA DUCKS IN THE NORTH PACIFIC: A MULTI-SCALE SEASONAL ANALYSIS OF ALASKAN OCEANS - Kelly E. Kapsar,** Benjamin K. Sullender, and Kathy J. Kuletz
11:15	***C5***	Anthony Wetherhill	**TRACKING OF COMMON MERGANSER/GOOSANDER IN SCOTTISH RIVER CATCHMENTS - Anthony S. Wetherhill,** David N. Carss, Chris Heward, Liz M. Humphreys, Mark W. Wilson and John Calladine
11:30 - 11:45			***Coffee Break (15 min)***
11:45	***C6***	Megan Ross	**MOVEMENT PATTERNS AND RISKS FROM ANTHROPOGENIC STRESSORS FOR SCOTERS WINTERING IN THE SALISH SEA - Megan V. Ross,** Joseph R. Evenson, Patrick D. O'Hara, William O'Shea, Matthiew Hamer, Kyle A. Spragens, W. Sean Boyd
12:00	***C7***	Dustin E. Meattey	**EVALUATING THE EFFECTIVENESS OF GULL CONTROL AS A MANAGEMENT TOOL FOR INCREASING COMMON EIDER DUCKLING SURVIVAL - Dustin E. Meattey,** Lucas Savoy, Kelsey Sullivan, Brad Allen, Daniel G. McAuley, Robin Dyer, and Chris Dwyer
12:15	***C8***	Dan Rizzolo	**LEAD EXPOSURE CONTINUES TO THREATEN SPECTACLED EIDERS ON THE YUKON-KUSKOKWIM DELTA DESPITE THREE DECADES OF PROTECTION UNDER THE ENDANGERED SPECIES ACT - Daniel Rizzolo,** Paul Flint, Kate Martin, and Neesha Stellrecht

WEDNESDAY, 10 JANUARY 2024			
	12:30	***C9***	Field Trip	**LONG-TAILED DUCKS OF NANTUCKET SOUND AND SHOALS -** Tori Mezebish Quinn and Glenn Olsen
12:45 - 13:00			**LIGHTNING TALKS**	
	12:45	***C10***	Tori Mezebish Quinn*	**MOVEMENT ECOLOGY OF GREATER SCAUP THAT WINTER IN SOUTHERN NEW ENGLAND - Tori Mezebish Quinn,** Peter Paton, Jennifer Kilburn, and Scott McWilliams
	12:50	***C11***	Olivia MC. Trudeau*	**ASSESSING THE ROLE OF OVER-WINTERING MARINE SITES IN SUPPORTING DECLINING SURF SCOTERS (MELANITTA PERSPICILLATA) IN THE SALISH SEA - Olivia MC. Trudeau** and Eric M. Anderson
	12:55			**LIGHTNING Q&A**
13:00 - 13:15				***Coffee Break (15 min)***
	13:15	***C12***	Luke Fara	**VISIBILITY CORRECTION FACTORS FOR MULTIPLE SPECIES OF WATERFOWL USING AN AERIAL REMOTE SENSING APPROACH - Luke J. Fara,** William Beatty, Mark Koneff, Drew Fowler, Taylor Finger, Kyle Landolt, Benjamin Finley, Janis Ruhser, Brian Gray, Steven Houdek, Aaron Wright, and Greg Marchel
	13:30	***C13***	Micah Miller	**MACHINE LEARNING INSIGHTS INTO NEST SITE SELECTION BY ARCTIC TUNDRA SEA DUCKS: A MULTISPECIES AND MULTISCALE PERSPECTIVE - Micah W. C. Miller,** James R. Lovvorn, Nathan R. Graff, Neesha C. Stellrecht, Mark J. Lara, and Christian Andresen
13:45 - 14:30			**ART EXHIBITION** *(Art Gallery)*	
	14:00		Round Tables	**SPATIAL ECOLOGY KNOWLEDGE GAPS** – Host: Dan Esler *(Lounge/Roundtable)*
	14:00			**End of live stream in Auditorium**

THURSDAY, 11 JANUARY 2024

10:00 - 15:00 CST		**COEXISTENCE AND CONSERVATION: ACTING FOR CLIMATE CHANGE ADAPTATION AND RESILIENCE**	
9:30			Live Streaming in the Auditorium
10:00		Emily Silverman	**OPENING REMARKS & ANNOUNCEMENTS**
10:05 - 10:30	***D1***	**Plenary:** David Douglas	**LONG-TERM ENVIRONMENTAL DATA: WHERE TO GET THEM AND WHAT TO LOOK FOR - David Douglas**
10:30	***D2***	Field Trip	**RESEARCH IN A CHANGING ARCTIC: 30 YEARS OF STUDYING EIDER DUCKS AND COMMUNITY ECOLOGY AT EAST BAY, IN THE CANADIAN ARCTIC -** Grant Gilchrist, Oliver Love, Reyd Smith, Christina Semeniuk, and Holly Hennin
10:45	***D3***	Kayla A. Shively	**PACIFIC COMMON EIDER NESTING SUCCESS IN ARCTIC ALASKA: EVALUATING THE CONSEQUENCES OF BARRIER ISLAND CHANGE - Kayla A. Shively,** Rebecca L. McGuire, and Martin Robards
11:00	***D4***	Emily C. MacDonald*	**SITTING DUCKS: PHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF INCUBATING EIDERS FACING THERMAL STRESS IN THE CANADIAN ARCTIC - Emily C. MacDonald,** Christina A. D. Semeniuk, H. Grant Gilchrist, and Oliver P. Love
11:15	***D5***	Dan Esler	**CONTRASTING INFERENCES FROM DIFFERENT DATA TYPES WHEN EVALUATING BARROW'S GOLDENEYE POPULATION DELINEATION - Dan Esler** and W. Sean Boyd
11:30 - 11:15			***Coffee Break (15 min)***
11:45	***D6***	David Safine	**RECENT DECLINES IN POPULATION INDICES FOR SPECTACLED EIDERS ON BOTH BREEDING AREAS IN ALASKA - David E. Safine**, Erik E. Osnas, Charles Frost, Heather M. Wilson, Michael A. Swaim and Julian B. Fischer
12:00	***D7***	Randall J. Friendly*	**CROSS-SEASONAL EFFECTS IN A SEA ICE-ASSOCIATED SEA DUCK: DO WINTER CONDTIONS AFFECT BREEDING SPECTACLED EIDERS? - Randall J. Friendly**, Mark Lindberg, Todd Brinkman, Christa Mulder, Daniel J. Rizzolo
12:15	***D8***	Micah Miller	**PREY AVAILABILITY AND FORAGING ACTIVITY BY TUNDRA-NESTING SEA DUCKS: STRONG PREFERENCE FOR SPECIFIC WETLAND TYPES - Micah W. C. Miller,** James R. Lovvorn, Nathan R. Graff, Neesha C. Stellrecht, and Steven P. Plesh
12:30	***D9***	Field Trip	**SEA DUCKS AND THE YUKON-KUSKOKWIM DELTA -** Tim Bowman
12:45 - 13:00		**LIGHTNING TALKS**	

THURSDAY, 11 JANUARY 2024			
	12:45	***D10***	Steven Plesh*	**ORGANIC MATTER SOURCES AND FLOWS IN TUNDRA WETLAND FOOD WEBS - Steven P. Plesh,** James R. Lovvorn, and Micah W. C. Miller
	12:50	***D11***	Annie Maliguine*	**CHANGING FORAGE CONDITIONS FOR MOLTING STELLER'S EIDERS (POLYSTICTA STELLERI) IN IZEMBEK LAGOON, ALASKA - Anastasia M. Maliguine,** Tuula E. Hollmen, Courtney L. Amundson, and Brenda H. Konar
	12:55			**LIGHTNING Q&A**
13:00 - 13:15				***Coffee Break (15 min)***
	13:15	***D12***	Lindsay Veazey	**OPTIMIZING SEA DUCK RESEARCH: COMPUTER VISION-BASED BEHAVIOR AND NEST SURVIVAL ANALYSIS - Lindsay Veazey,** Tuula Hollmen, and Chris Latty
	13:30	***D13***	Jacob Hewitt*	**ECOLOGICAL FACTORS DRIVE INTERANNUAL VARIATION OF SEA DUCK RECRUITMENT RATES - Jacob Hewitt,** Jason N. Straub, and Anthony J. Roberts
13:45 - 14:15		***D14***	Fritz Reid	**PANEL DISCUSSION: BOREAL FIRES - Fritz Reid and Chief Steven Nitah**
14:15 - 15:00				**CLOSING REMARKS & AWARDS CEREMONY** *(Auditorium)*
	15:00			**End of live stream in Auditorium**


Long-tailed Duck
by Raymond Easton

POSTER PRESENTATIONS

11:45 - 13:00 CST — **TUESDAY, 9 JANUARY 2024**

P1	Andrew Annanie*	**CHARACTERIZATION OF THE MIGRATORY PATTERNS, TIMING, CONNECTIVITY, AND SITE FIDELITY OF THE WESTERN NORTH AMERICAN HARLEQUIN DUCK (HISTRIONICUS HISTRIONICUS) POPULATION THROUGHOUT THE ANNUAL CYCLE - Andrew Annanie**, David Douglas, W. Sean Boyd, Joseph Evenson, Lisa Bate, Beth MacCallum, Lucas Savoy, and Chris Hammond
P2	Céline Arzel	**COMMON EIDER SOMATERIA MOLLISSIMA UNDER PRESSURE FROM ENDOCRINE DISRUPTING CHEMICALS - Céline Arzel,** Amalie Ask, Farshad Sajjad Vakili, Prescillia Lemesle, Sunniva H. Frøyland, Elise Lunde, Silje Peterson, Anne-Fleur Brand, Junjie Zhang, Tomasz M. Ciesielski, Alexandros G. Asimakopoulos, Kristina Noreikiene, Bin-Yan Hsu, Suvi Ruuskanen, Juho Jolkkonen, Titiksha Peetumber, Nora M. Wilson, Stefan Björkman, Christian Sonne, Sanna Koivisto, Markus Öst, Kim Jaatinen, Bertille Mohring, Jón Einar Jónsson, Martin Hansen and Veerle Jaspers
P3	David Douglas (Plenary)	**LONG-TERM ENVIRONMENTAL DATA: WHERE TO FIND IT AND WHAT TO LOOK FOR** – David Douglas
P4	Bruce Harrison	**ASSOCIATING SEA DUCKS WITH COASTAL HABITATS IN BRITISH COLUMBIA - Bruce Harrison**, Kathleen Moore, Llwellyn Armstrong, Jim Devries and Dan Buffett
P5	Robert Hughes	**BREEDING COMMON SCOTERS IN SCOTLAND'S EASTERN FLOW COUNTRY: 22-YEAR PRODUCTIVITY TRENDS AND CORRELATES - Robert Hughes**
P6	Elisabeth Knudsen*	**ASSESSING COLOUR VARIATION OF THE COMMON EIDER, SOMATERIA MOLLISSIMA, IN THE FAROE ISLANDS AND ICELAND - Elisabeth Knudsen,** Snæbjörn Pálsson, Ellen Magnúsdóttir, James A. Fletcher, Árni Ásgeirsson, Jóhannis Danielsen, Sveinn Are Hanssen, and Jón Einar Jónsson
P7	Shayla L. Kroeze*	**EXAMINING THE DYNAMICS OF CHOLERA IMMUNITY IN COMMON EIDERS IN THE CANADIAN ARCTIC USING WHOLE GENOME ANALYSIS - Shayla L. Kroeze,** Oliver P. Love, Mark R. Forbes, H. Grant Gilchrist, and Vicki L. Friesen
P8	Kate H. Martin	**ATLAS OF SEA DUCK KEY HABITAT SITES IN NORTH AMERICA - (Kate H. Martin)** Tim D. Bowman, James L. Churchill, Christine Lepage, Shannon S. Badzinski, Scott G. Gilliland, Nic R. McLellan, and Emily D. Silverman
P9	Julius Morkūnas	**INGESTION OF PLASTIC AND NON PLASTIC DEBRIS IN SEA DUCKS IN BALTIC SEA - Julius Morkūnas** and Rasa Morkūnė

POSTER PRESENTATIONS

P10	Aiva C.M. Noringseth*	**LONG-TAILED DUCK (CLANGULA HYEMALIS) WITH YOUNG IN TUYA MOUNTAINS PROVINCIAL PARK A FIFTH BREEDING RECORD FOR BRITISH COLUMBIA - Aiva C.M. Noringseth** and Jack Bindernagel
P11	Eileen Pike	**POINT LEPREAU BIRD OBSERVATORY - MONITORING SEA DUCK SPRING MIGRATION IN THE BAY OF FUNDY -** Antony W. Diamond, James D. Kelley, Heather L. Major, Todd Watts, James G. Wilson, **Eileen Pike**
P12	Olga Prokopenko*	**PROTECTIVE NESTING ASSOCIATIONS OF THE PACIFIC COMMON EIDER IN THE ASIAN PART OF THE RANGE: RANDOM COINCIDENCE OF NESTING SITES OR DELIBERATE CHOICE? - Olga Prokopenko,** Daria Barykina, and Diana Solovyeva
P14	Samantha E. Richman	**LIVING PILING: A NOVEL APPROACH TO SUBTIDAL HABITAT RESTORATION FOR SEA DUCKS - Samantha E. Richman** and Susan E.W. De La Cruz
P15	Samantha E. Richman	**RESTORATION OPPORTUNITIES FOR SEA DUCK POPULATIONS INJURED BY COASTAL OIL SPILLS - Samantha E. Richman,** Susan E.W. De La Cruz, Carolyn Marn, Dan Esler, Abby Powell, Stuart Slattery, and Ramūnas Žydelis
P16	Fiona S. Rickowski*	**LONG-TERM DATA REVEAL CONTRASTING IMPACTS OF NATIVE VERSUS INVASIVE NEST PREDATORS IN ICELAND -** Jón Einar Jónsson, **Fiona S. Rickowski**, Florian Ruland, Árni Ásgeirssonand Jonathan M. Jeschke
P17	Nora M. Wilson*	**TOURISM AT AN EIDER COLONY: A MUTUALLY BENEFICIAL RELATIONSHIP - Nora M. Wilson,** Peppi Wilson, and Henrik Wilson
P18	Ramūnas Žydelis	**LONG-TAILED DUCK (CLANGULA HYEMALIS) AS UNDERWATER SPECIES - Ramūnas Žydelis,** Julius Morkūnas, and Rasa Morkūnė


Arctic Royalty
by Cynthia Fisher

ABSTRACTS FOR ORAL PRESENTATIONS

A1 - Monday, 8 January 2024, 10:15 CST
Plenary

THE SEA DUCK JOINT VENTURE PARTNERSHIP: ADDRESSING KNOWLEDGE GAPS THROUGH LARGE-SCALE COLLABORATIONS

Kate H. Martin, Margaret Campbell, Ken D. Richkus, Al R. Hanson, David E. Safine, and Shannon S. Badzinski

KHM: Sea Duck Joint Venture, US Coordinator, U.S. Fish and Wildlife Service, Anchorage, Alaska, USA; kate_martin@fws.gov
MC: Sea Duck Joint Venture, Canada Coordinator, Canadian Wildlife Service, Whitehorse, Yukon, Canada
KDR: Sea Duck Joint Venture Management Board Co-Chair, U.S. Fish and Wildlife Service, Falls Church, Virginia, USA
ARH: Sea Duck Joint Venture Management Board Co-Chair, Canadian Wildlife Service, Sackville, New Brunswick, Canada
DES: Sea Duck Joint Venture Continental Technical Team Co-Chair, U.S. Fish and Wildlife Service, Anchorage, Alaska, USA
SSB: Sea Duck Joint Venture Continental Technical Team Co-Chair, Canadian Wildlife Service, Ottawa, Ontario, Canada

An increased awareness of sea duck population declines and the paucity of data on basic sea duck ecology spurred the creation of the Sea Duck Joint Venture (SDJV) in 1999 under the auspices of the North American Waterfowl Management Plan. The SDJV is a self-directed partnership co-chaired by the U.S. Fish and Wildlife Service and Canadian Wildlife Service and includes members from federal, state/provincial, and non-governmental organizations in the U.S. and Canada. The SDJV works with partners to develop, fund, and communicate the results of research and monitoring that addresses information gaps related to the management and conservation of North American sea ducks. Through supporting over 170 research projects to date, the SDJV has delineated populations, identified population-limiting factors, and characterized migratory routes and important habitats for several species. Over time, the focus of the SDJV has evolved from resolving basic ecological questions to prioritizing work explicitly linked to conservation and management actions. The SDJV has provided guidance on monitoring priorities and sea duck harvest sustainability and developed survey methods including improved species detection and identification techniques. More recently, the SDJV developed the Sea Duck Key Habitat Sites Atlas that identifies 85 sites most critical to sea duck populations in North America to aid in habitat protection, marine spatial planning, and environmental assessments. In addition, the SDJV Student Fellowship Program supports early career biologists contributing to sea duck research and conservation. We briefly describe the SDJV partnership, the priorities set in the 2022 SDJV Strategic Plan, and the process for soliciting and selecting projects for SDJV funding. We highlight recent SDJV-supported research contributing to the science and management of sea ducks, describe information gaps and priorities that we hope to address in the future, and provide tips to improve the competitiveness of proposals and fellowship applications submitted to the SDJV.

A3 - Monday, 8 January 2024, 11:00 CST

EVALUATING CONSERVATION UNITS AT THE CONTINENTAL SCALE USING NETWORK ANALYSIS: A SEA DUCK CASE STUDY

Juliet S. Lamb, Clara Cooper-Mullin, Scott G. Gilliland, Alicia M. Berlin, Timothy D. Bowman, W. Sean Boyd, Susan E.W. De La Cruz, Daniel Esler, Joseph R. Evenson, Paul Flint, Christine Lepage, Dustin E. Meattey, Jason E. Osenkowski, Peter W.C. Paton, Matthew C. Perry, Dan Rosenberg, Jean-Pierre L. Savard, Lucas Savoy, Jason Schamber, David. H. Ward, John Y. Takekawa, and Scott R. McWilliams

JSL: Department of Natural Resources Science, University of Rhode Island, Kingston, RI and Rhode Island Department of Environmental Management, West Kingston, RI; current affiliation: The Nature Conservancy, Cold Spring Harbor, NY, USA; juliet.lamb@tnc.org
CC-M, PWCP, SRM: Department of Natural Resources Science, University of Rhode Island, Kingston, RI, USA
SGG: Canadian Wildlife Service, Sackville, NB, Canada
AMB, MCP: US Geological Survey, Eastern Ecological Research Center, Laurel, MD, USA
TDB: Sea Duck Joint Venture, US Fish and Wildlife Service (retired), Anchorage, AK, USA WSB: Science & Technology Branch, Environment and Climate Change Canada, Delta, BC, Canada
SEWD: US Geological Survey, Western Ecological Research Center, Moffett Field, CA, USA
DE, PEF: US Geological Survey, Alaska Science Center, Anchorage, AK, USA
JRE: Washington Department of Fish and Wildlife, Olympia, WA, USA
CL: Canadian Wildlife Service, Quebec City, QC, Canada
DEM: Biodiversity Research Institute, Portland, ME, USA
DR: Alaska Department of Fish and Game, Anchorage, AK, USA
JPLS: Science & Technology Branch, Environment and Climate Change Canada, Quebec City, QC, Canada
JYT: Suisun Resource Conservation District, Suisun City, CA, USA

Conserving migratory wildlife requires understanding how groups of individuals interact across seasons and landscapes. Telemetry reveals individual movements at large spatiotemporal scales; however, using movement data to define conservation units requires scaling up from individual movements to species-and community-level patterns. We developed a framework to define flyways and identify important sites from telemetry data and applied it to long-term, range-wide tracking data from three species (640 individuals) of North American scoters (*Melanitta* spp.). Our network of 88 nodes included both multi-species hotspots and areas uniquely important to individual species. We found limited spatial overlap between scoters wintering on the Atlantic and Pacific coasts of North America, with differing connectivity patterns between species. Black scoters from Eastern and Western wintering sites did not overlap; however, surf and white-winged scoters overlapped across a limited range of breeding sites, which showed high levels of importance for population connectivity in the multi-species network. We also used the network model to identify four distinct multi-species conservation units based on individual movements, which did not correspond to traditional management flyways. While Eastern scoters showed similar connectivity patterns and migration routes across all species, migratory routes were less uniform for Western scoter populations and groups of interconnected sites differed among species. Overall, we show how individual movements can be used to quantify connectivity of migratory species at range-wide scales and identify potential gaps in landscape-level conservation strategies.

A4 - Monday, 8 January 2024, 11:15 CST

VITAL RATES OF NON-BREEDERS AND RETURNING BREEDERS STRONGLY INFLUENCE POPULATION DYNAMICS FOR THE COMMON EIDER

Alex Nicol-Harper*, Kevin A. Wood, Geoff M. Hilton, C. Patrick Doncaster, and Thomas H. G. Ezard

ANH: National Oceanography Centre, University of Southampton and Wildfowl & Wetlands Trust, UK; alex.nicol-harper@wwt.org.uk
KW: Wildfowl & Wetlands Trust, UK
GH: Wildfowl & Wetlands Trust, UK
CPD: Biological Sciences, University of Southampton, UK
TE: National Oceanography Centre, University of Southampton, UK

Intermittent breeding, whereby recruited individuals forgo attempting reproduction in some breeding periods, is one of the least understood avian life-history parameters. It has been observed in various sea ducks, including the well-studied Common Eider (*Somateria mollissima*), for which we found a mean breeding propensity of ~0.75, equivalent to one-quarter of females skipping breeding each year, or each female skipping once per 4 years. We asked whether this represents a short-term response to poor body condition or a long-term strategy maximizing lifetime reproductive output, with implications for population projection and optimized conservation action. We parameterised matrix population models to consider the effects of different incorporations of intermittent breeding. Our first life-cycle formulation included a discrete and reversible 'non-breeder' state, which revealed that population growth rate was driven primarily by breeding-state transitions. To investigate the possibility of longer-lasting impacts of intermittent breeding on population dynamics, we modeled a life cycle with a 'refreshed breeder' stage, to which individuals transition for the time-step following non-breeding. This accounted for the high survival cost of breeding, estimated from the significant proportion of mortality incurred during the breeding season. Transitions in and out of the 'refreshed breeder' stage had the capacity to strongly influence population growth rate, mostly driven by the potential for differential survival of 'refreshed breeders'. These results indicate a need for focussed data-gathering on individuals moving between breeding and nonbreeding states, either from field observations or from existing individual-based datasets.

A5 - Monday, 8 January 2024, 11:45 CST

REMOTE SENSING FOR BROAD-SCALE POPULATION SURVEYS OF SEA DUCKS: PROGRESS AND CHALLENGES

Mark D. Koneff, Bradley A. Pickens, Ryan C. Dotson, Timothy P. White, Kyle L. Landolt, Luke J. Fara, Aaron C. Murphy, and Jennifer J. Dieck

MDK: Division of Migratory Bird Management, US Fish and Wildlife Service, Orono, ME, USA; mark_koneff@fws.gov
BAP: Division of Migratory Bird Management, US Fish and Wildlife Service, Laurel, MD, USA
RCD: Quantaero, Reno, NV, USA
TPW: Environmental Studies Program, Bureau of Ocean Energy Management, Sterling, VA, USA
KLL, LJF, ACM, JJD: Upper Midwest Environmental Sciences Center, Lacrosse, WI, USA

Broad-scale population surveys of waterfowl and other migratory birds have traditionally been accomplished by human observers using aircraft flown at low altitude. These methods have proven to be rapid and cost-efficient, however they subject the aircrew to increased risk. In addition, while advanced analytical methods exist to adjust counts for various sources of observer bias, field implementation can be difficult and increases survey cost. Remote sensing increases safety by allowing data collection at higher altitudes and creates a permanent record of observations that offers new opportunities to adjust for detection and classification biases. We have deployed advanced remote sensing systems for USFWS aircraft to support high resolution imaging of waterfowl and other wildlife. These systems generate very large volumes of data during broad-scale surveys that exceed the capacity of natural resources agencies to process manually. Computer vision and machine learning methods are being developed to automate detection and classification of wildlife from imagery. Workflows involving in-flight data processing increase efficiencies. We will review progress and ongoing challenges in development of acquisition technologies, large volume data handling, machine learning processing methods, and use of machine learning outputs in estimation of population size.

A6 - Monday, 8 January 2024, 12:00 CST

INSIGHTS INTO THE BREEDING DISTRIBUTION AND CHRONOLOGY OF NORTH AMERICAN SCOTERS FROM SATELLITE TELEMETRY DATA

Kristin Bianchini, Scott G. Gilliland, Alicia M. Berlin, Tim D. Bowman, W. Sean Boyd, Susan E.W. De La Cruz, Dan Esler, Joseph R. Evenson, Paul L. Flint, Christine Lepage, Scott R. McWilliams, Dustin E. Meattey, Jay E. Osenkowski, Matthew C. Perry, Jean-François Poulin, Eric T. Reed, Christian Roy, Jean-Pierre L. Savard, Lucas Savoy, Jason L. Schamber, Caleb S. Spiegel, John Takekawa, David H. Ward and Mark L. Mallory

KB, CR: Canadian Wildlife Service, Environment and Climate Change Canada, Gatineau, QC, Canada; kristin.bianchini@ec.gc.ca
SGG: Canadian Wildlife Service, Environment and Climate Change Canada, Sackville, NB, Canada
AMB, MCP: US Geological Survey, Eastern Ecological Research Center, Laurel, MD, USA
TDB: US Fish and Wildlife Service, Anchorage, AK, USA
WSB: Canadian Wildlife Service, Environment and Climate Change Canada, Delta, BC, Canada
SEWD, JT: US Geological Survey, Western Ecological Research Center, San Francisco Bay Estuary Field Station, Moffett Field, CA, USA
JT: Suisun Resource Conservation District, Suisun City, CA, USA
DE, PLF, DHW: US Geological Survey, Alaska Research Center, Anchorage, AK, USA
JRE: Washington Department of Fish and Wildlife, Olympia, WA, USA
CL: Canadian Wildlife Service, Environment and Climate Change Canada, Québec City, QC, Canada
SRM: Department of Natural Resources Science, University of Rhode Island, Kingston, RI, USA
DEM, LS: Biodiversity Research Institute, Portland, ME, USA
JEO: Rhode Island Department of Environmental Management, West Kingston, RI, USA
JFP, JPLS: Sciences and Technology, Environment and Climate Change Canada, Québec City, QC, Canada
ETR: Canadian Wildlife Service, Environment and Climate Change Canada, Yellowknife, NT, Canada
JLS: Alaska Department of Fish and Game, Anchorage, AK, USA
CSS: US Fish and Wildlife Service, Migratory Birds Division, Hadley, MA, USA
MLM: Department of Biology, Acadia University, Wolfville, NS, Canada

North America's Scoter species are poorly monitored relative to other waterfowl. Black (*Melanitta americana*), Surf (*M. perspicillata*), and White-winged (*M. deglandi*) Scoter abundance and trend estimates are thus uncertain in many parts of these species' ranges. Our goal was to refine our understanding of the spatial and temporal distributions of scoters to inform the timing and location of breeding surveys. In this study, we integrated satellite telemetry tracking data from Black, Surf, and White-winged Scoters marked at multiple molting, staging, breeding, and wintering areas along the Atlantic and Pacific coasts to quantify Scoter breeding chronology and distribution across North America. We also examined possible drivers of variation in timing of arrival, length of stay, and departure at nesting locations. We documented a northwest to southeast distribution of estimated breeding sites across Alaska and Canada. On average, Scoters arrived at nest sites on June 1. Surf Scoters and Pacific Black Scoters arrived earliest and departed earliest. Pacific-wintering Black and White-winged Scoters began breeding earlier than Atlantic-wintering birds. Additionally, birds arrived at nesting locations earlier in years with earlier snowmelt, and later snowmelt reduced lengths of stay for males. Breeding chronology also varied by age group, with adults arriving earlier than subadults. Our study is the first to comprehensively describe spatial variation in timing of breeding of both Atlantic and Pacific populations of all three Scoter species across North America. Our results provide insight into how current surveys enumerate Scoters and can inform possible supplemental efforts to improve continental scoter monitoring.

A7 - Monday, 8 January 2024, 12:15 CST

AUTOMATING THE DETECTION AND CLASSIFICATION OF SEA DUCKS AND OTHER WILDLIFE IN AERIAL IMAGERY WITH MACHINE LEARNING METHODS

Kyle Landolt, Tim White, Mark Koneff, Brad Pickens, Aaron Murphy, Matthew Walker, Jennifer Dieck, Luke Fara, Dave Fronczak, and Stella Yu

KL, AM, MW, JD, and LF: Upper Midwest Environmental Sciences Center, La Crosse, WI, USA
klandolt@usgs.gov
TW: Bureau of Ocean Energy Management, Division of Environmental Sciences, Sterling, VA, USA
MK: U.S. Fish and Wildlife Service – Division of Migratory Bird Management, Orono, ME, USA
BP: U.S. Fish and Wildlife Service – Division of Migratory Bird Management, Laurel, MD, USA
DF: U.S. Fish and Wildlife Service – SD Wetland Management District, Bismarck, ND, USA
SY: The University of Michigan, Ann Arbor, MI, USA

Avian and wildlife population surveys can help inform environmental assessments, and impact analyses of offshore energy development projects. Low-flying ocular aerial surveys have historically been used to estimate waterfowl populations, but place personnel at risk of injury and survey results are prone to bias and misclassification. The U.S. Geological Survey (USGS), in collaboration with the Bureau of Ocean Energy Management (BOEM) and the U.S. Fish and Wildlife Service Division of Migratory Bird Management (USFWS-DMBM), is advancing the development of deep learning algorithms and tools to automate the detection, enumeration, and classification of sea ducks and other marine wildlife. Aerial imagery collected from the Atlantic Outer Continental Shelf and the Great Lakes provide data for algorithm development. OpenCV's Computer Vision Annotation Tool (CVAT) is providing the annotation framework, allowing wildlife experts to efficiently create annotations and support database development.

We have labeled approximately 79,306 objects in 6,030 images. These objects include birds, mammals, reptiles, and more. Using 10,000 annotated bird objects, we developed an object detection model using a MaskRCNN framework. The model explicitly detects birds without any further classification. Current performance is benchmarked at a mAP (mean average precision) of 0.45 and an AR (average recall) of 0.56. Background color and glare presence is also shown to have impact on detection performance. Further work will be done to implement a multi-object detection model to detect and predict objects of certain species, age, sex, and activity while taking other co-variates like ground sampling distance into account. Lastly, we find that using deep learning algorithms to detect birds reduces the time manually annotating bird objects by 95%, rapidly accelerating annotation development. (under internal USGS review)

A9 - Monday, 8 January 2024, 12:35 CST

ENGAGING A TRANSBOUNDARY EXPERT NETWORK TO PRIORITIZE COASTAL AND MARINE HABITAT MANAGEMENT FOR SEA DUCKS IN THE SALISH SEA

David Bradley and Danielle Ethier

DB, DE: Birds Canada, Delta, BC, Canada; dbradley@birdscanada.org

Sea ducks constitute a marine bird vital sign indicator of ecosystem health in the Salish Sea, which is of global importance to many populations of marine birds that use different parts of the ecosystem through the course of each annual cycle. It is imperative to work across management jurisdictions to effectively conserve or recover key areas of habitat for these birds. However, the jurisdictional complexity presents a major challenge to taking an ecosystem scale approach to the problem, not least because many information sources (e.g., biological datasets) end at the international border.

We overcame this barrier by harmonizing avian and geospatial information in a way that can assist the agencies responsible for implementing conservation prescriptions, especially in terms of identifying and managing key habitats. Our project convened a network of scientists and managers from both Canadian and U.S. jurisdictions of the Salish Sea to implement a three-phase project. The project goals included, 1) engaging a group of experienced analysts working on sea ducks and their habitats, to identify and assess compatibility of relevant bird and environmental datasets; 2) convening both analysts and conservation managers at an in-person workshop to finalize the choice of data layers and recommend a unified approach to modelling sea duck habitat at the scale of the Salish Sea ecosystem; and 3) completing a detailed preparation of the avian and geospatial data to facilitate future sea duck model(s). The final product was delivered in a webinar to management agencies, and options for using the project and model outputs to inform conservation planning were discussed.

A10 - Monday, 8 January 2024, 12:40 CST

SEA DUCK AND SEABIRD MONITORING IN THE CANADIAN ARCTIC

Julia E. Baak

JEB: Canadian Wildlife Service, Environment and Climate Change Canada, P. O. Box 1870 Iqaluit, Nunavut, Canada; julia.baak@ec.gc.ca

The Canadian Arctic contains most of Canada's coastal and marine zones, and this region supports substantial populations of sea ducks and seabirds. However, as a region that is logistically challenging to monitor, many of these areas have not been surveyed in decades and the abundance of birds in these regions are unknown. Many species, such as King Eiders (*Somateria spectabilis*) and Common Eiders (*S. mollissima*), are culturally and nutritionally significant for nearby communities. However, as climate change continues to shift access to open water and sea ice, subsequently increasing development and marine traffic, the marine birds that rely on this region for feeding and resting may be at an increased risk. Thus, from a community and a conservation perspective, understanding the abundance of these species in the Canadian Arctic is important to inform conservation and management. Here, we review information on key marine habitat sites for sea ducks and seabirds across the Canadian Arctic to develop a prioritization plan for future monitoring across this region. This prioritization structure combines information on the species present at each site (e.g., conservation status, population size and trends, timing of use of key site), previous surveys at the site (e.g., previous survey timing and methods) as well as characteristics of the site itself (e.g., protection status, anthropogenic activities and threats, indigenous importance) to prioritize sites for monitoring. We present preliminary results and discuss next steps for monitoring seabirds and sea ducks across the Canadian Arctic.

A11 - Monday, 8 January 2024, 12:45 CST

A PHOTO SURVEY TO ESTIMATE ANNUAL RECRUITMENT IN ATLANTIC FLYWAY SEA DUCK POPULATIONS

Jacob Hewitt*, Jason N. Straub, Anthony J. Roberts, and Kelsey Sullivan

JH, JS: State University of New York-Brockport, Brockport, NY, USA; hewittj4114@gmail.com
AJR: Division of Migratory Bird Management, US Fish and Wildlife Service, Laurel, MD, USA
KS: Maine Department of Inland Fisheries and Wildlife, Bangor, ME, USA

Sea duck (Tribe Mergini) populations in the Atlantic Flyway have experienced significant declines in recent years, though underlying causes are poorly understood. Information on population demographic parameters may provide insight for wildlife managers seeking to maintain sustainable harvest. However, population monitoring capacity for sea ducks is limited relative to other migratory bird species due to their remote breeding distribution. The U.S. Fish and Wildlife Service organizes a Parts Collection Survey (PCS) which estimates recruitment in sea duck populations using age ratios (juveniles/adult), though estimates are biased due to differential harvest vulnerability between age-cohorts. I used a direct-count photo survey to calculate improved estimates of annual recruitment for Long-tailed Duck, Black Scoter, Surf Scoter, and White-winged Scoter (hereafter sea ducks) populations in the Atlantic Flyway. I and other surveyors collected photos of flighted sea ducks from shore and by boat in 11 states from October 15-December 15 annually in 2019-2022. We classified photographed birds according to age and sex and calculated juvenile proportions of each species using a Bayesian binomial model. To compare photo survey estimates with PCS estimates, I used a paired t-test organized by year. I found that PCS estimates of juvenile proportions were significantly greater than photo survey estimates for three sea duck species, indicating a consistent positive bias in PCS driven by harvest vulnerability. I also derived novel estimates of juvenile harvest vulnerability using the mean difference between within-year estimates. My work demonstrated the photo survey methodology used in this study produced reliable and precise annual recruitment estimates for four poorly monitored waterfowl populations; I recommend managers continue to adopt this approach in future years with additional consideration given for spatial representation and refinement of image classification procedures for Long-tailed Duck estimates.

A12 - Monday, 8 January 2024, 12:50 CST

CAN STUDIES OF BREEDING SUCCESS AND MIGRATION ROUTES EXPLAIN THE RECENT DECLINES OF COMMON EIDER, VELVET SCOTER AND RED-BREASTED MERGANSER IN THE BALTIC SEA?

Fredrik Haas, Niklas Liljebäck, Johan Månsson, Ib K. Petersen, Jacob Sterup, Adam Stålnäbb and **Iben H. Sørensen**

FH: Lund University, Lund, Sweden
NL, AS: Swedish Hunters' Association, Nyköping, Sweden
JM: Swedish University of Agricultural Sciences, Uppsala, Sweden
IKP, JS: Aarhus University, Aarhus, Denmark
IHS: Danish Hunters' Association, Rønde, Denmark; ihs@jaegerne.dk (current email: ihs@ecos.au.dk)

Several sea duck species breeding in the Nordic countries are in focus due to long-term population declines and a lack of knowledge on the most basic parameters related to the management of these and other threatened species. The Baltic Sea is an internationally important wintering area for diving ducks from large parts of Russia and Scandinavia, yet the migratory behaviour and wintering sites of both Nordic and Arctic populations are still poorly known. Working in Sörmland's Archipelago in the Swedish part of the Baltic Sea, the aim of this project is to study the breeding ecology, and to trap incubating females of three redlisted sea duck species (Common Eider *Somateria mollissima*, Red-breasted Merganser *Mergus serrator* and Velvet Scoter *Melanitta fusca*) to track their movements during the non-breeding period by means of geolocators. Such data will be extremely valuable for the successful implementation of international management plans such as the one for Velvet Scoter (AEWA, 2018) and Common Eider (AEWA, 2022).

The project started in 2021, and during the breeding seasons we locate, map and monitor hundreds of nests – covering an entire island in the archipelago. During the field seasons in 2021 and 2022, we also x-rayed trapped females to study crippling rates. We will present our data on nesting success, crippling rates, and preliminary tracks resulting from recaptures of females carrying geolocators.

A13 - Monday, 8 January 2024, 13:15 CST

PACIFIC BARROW'S GOLDENEYE REFINE SPRING MIGRATORY PHENOLOGY IN RESPONSE TO ENVIRONMENTAL CONDITIONS

Jesse Kemp*, W. Sean Boyd, Tesia M. Forstner, Daniel Esler, Timothy D. Bowman, David C. Douglas, Danica Hogan, Malcolm McAdie, Jonathan E. Thompson, Megan Willie, and David J. Green

JK, TMF, DJG: Simon Fraser University, Burnaby, BC, Canada; jessek@sfu.ca
WSB, DH, MW: Environment and Climate Change Canada, Delta, BC, Canada
DE, DCB: US Geological Survey, Alaska Science Center, Anchorage, AK, USA
TDB: US Fish and Wildlife Service (retired), Sea Duck Joint Venture, Anchorage, AK, USA
MM: Malcolm McAdie Wildlife Veterinary Services, Marmot Recovery Foundation, Nanaimo, BC, Canada
JET: Alberta Environment and Parks, Alberta, Canada

The broad seasonal timing of bird migrations is determined by internal biological clocks, which are synchronized by external cues, such as photoperiod. Birds may further refine their migratory timing by responding to external environmental conditions, such as temperature, snow cover, or seasonal patterns of food availability. We use 11 years of satellite telemetry data to assess how interannual variation in environmental cues affects the timing of migration of adult Pacific Barrow's Goldeneye (*Bucephala islandica*) across the species' Pacific range. Birds at higher latitudes initiate spring and moult migrations later and fall migration earlier than individuals at lower latitudes. After controlling for the effects of latitude, we found that individual Barrow's Goldeneye refine their spring migratory phenology in response to environmental conditions. Birds depart their wintering grounds earlier in years with warmer springs on their wintering grounds and arrive on their breeding grounds earlier in years with earlier annual snowmelt on their breeding grounds. Because birds respond to environmental conditions both at the beginning and end of spring migration, our results suggest that Barrow's Goldeneye update their migratory decision-making enroute when they encounter novel environmental conditions. Sensitivity to environmental cues suggests that Barrow's Goldeneye may have behavioural plasticity that is adaptive when faced with ongoing climate change.

A14 - Monday, 8 January 2024, 13:20 CST

CONSPECIFIC BROOD PARASITISM IN RED-BREASTED MERGANSERS: PARASITE BEHAVIOR AND HOST FITNESS COSTS

Shawn R. Craik and Rodger D. Titman

SRC: Département des Sciences, Université Sainte-Anne, Pointe-de-l'Église, NS, B0W 1M0, Canada; shawn.craik@usainteanne.ca
RDT: Department of Natural Resource Sciences, McGill University, Montreal, QC, H9X 3V9, Canada

Conspecific brood parasitism (CBP) is an intriguing alternative reproductive tactic that is especially common in waterfowl. Nonetheless, demographic studies of CBP are known for only a few species, so we still do not fully comprehend the adaptative significance of CBP across ecological contexts in which the behavior occurs. CBP is an important, yet relatively unexplored feature of the nesting biology of Red-breasted Mergansers (*Mergus serrator*). We assessed (i) cues used by parasites for selecting host nests and (ii) effects of CBP on host lifetime fitness in a colony of Red-breasted Mergansers in which nests are placed in dense upland vegetation on a coastal archipelago. Brood parasites did not select host nests based on traits providing cues about nest-site safety or host quality. Rather, natural nests were much more likely to be parasitized than experimental nests, suggesting that host presence can act as a cue for parasites looking to lay their foreign eggs. Parasitic eggs were almost always laid during the host laying cycle and typically in nests initiated early in the season. Indeed, rates of parasitism throughout a host's lifetime (range 0-100% of nests) increased with earlier dates of nest initiation. CBP was not linked to annual survival in hosts, however, we detected measurable costs of brood parasitism to hosts' current reproduction. Hatching success throughout a host's lifetime declined with a greater number of foreign eggs added to the individual's nests. Despite this, hosts spent little time at the nest prior to incubation and did not remove parasite eggs immediately after being laid. The lack of strong host defense against CBP may reflect in part weak selection pressure given that host fitness costs of parasitism in this population were apparently small for nests with light parasitism (e.g., 1-3 foreign eggs).

A15 - Monday, 8 January 2024, 13:25 CST

NEST BOX SELECTION BY BREEDING COMMON GOLDENEYE (*BUCEPHELA CLANGULA*) IN THE CHENA RIVER SYSTEM, INTERIOR ALASKA

Riley Porter*, J. Brian Davis, Melanie Boudreau, Guiming Wang, and Eric Taylor

RP, JBD, MB, FW: Forest and Wildlife Research Center, Mississippi State University, Mississippi State, MS, USA; rdp275@msstate.edu
ET: Bureau of Ocean Energy Management, Anchorage, AK, USA

The Common Goldeneye (*Bucephala clangula*) is a cavity nesting sea duck that predominately breeds in boreal forest systems. Goldeneyes spend 7-8 months of their annual cycle in both freshwater and marine environments but subsequently return inland to freshwater habitats to breed. Artificial nest boxes are used to increase breeding populations of goldeneyes and other waterfowl in Europe and North America. In 1993, the University of Alaska Student Chapter of The Wildlife Society received funding from Ducks Unlimited to assess nesting ecology of common goldeneyes at the northern limit of their breeding range. Starting in 1997, 150 nest boxes were deployed in the 639 km^2 Chena River State Recreation Area, located approximately 48 km northeast of Fairbanks, Alaska. Although productivity, duckling survival, nest attendance and other aspects of common goldeneye breeding ecology have been reported, no information exists on how environmental variables may potentially impact goldeneyes' choice of nest boxes. Because approximately 30% of the boxes have remained unoccupied since 2005, we assess how resource characteristics at various scales influence nest box selection by breeding goldeneyes.

Here, we report on how distance to nearest occupied nest box, nest box visibility, and other factors potentially influence nesting site selection. Results of this study will increase our understanding of nest site selection at multiple scales to better evaluate boreal wetland habitats for this species in interior Alaska.

A16 - Monday, 8 January 2024, 13:30 CST

SEA DUCK RESEARCH OPPORTUNITIES AND RESOURCES AT PINOLA CONSERVANCY

Jacob S. Kraemer

JSK: Pinola Conservancy, Aviary Director, Shreveport, LA, USA; jkraemer@pinola.net

Pinola Conservancy, located in Shreveport, Louisiana, is a private aviary, accredited by the Association of Zoos and Aquariums (AZA), dedicated to the preservation of birds, with a focus on northern hemisphere Anseriformes, Charadriiformes, and Passeriformes. Pinola produces and shares birds along with research opportunities and educational outreach. Pinola Conservancy is eager to offer opportunities for controlled research work within its fully acclimated captive flock of sea ducks. Pinola offers opportunities to work with a wide range of sea duck species of varying individual numbers which include:

Long-tailed Duck
Harlequin Duck
Steller's Eider
Spectacled Eider
Common Eider (*dresserii and v-nigra*)
King Eider
Common Scoter
Black Scoter
White-winged Scoter
Surf Scoter
Common Goldeneye
Barrow's Goldeneye
Bufflehead
Hooded Merganser
Red-breasted Merganser
Common Merganser

Working with these species in our 40,000 square feet of controlled aviary settings and environments allows research to focus on the study subject without uncontrolled biases or variables. Researchers have access to:

Captive husbandry expertise
Full veterinary clinic and resources
Controlled diets
Controlled enclosure conditions
Sterile environments, free of parasites and pathogens

Pinola opens these opportunities to all fields of research as we endeavor to further our collaborative efforts with the sea duck research community.

B1 - Tuesday, 9 January 2024, 10:10 CST

CREATING AN INUIT-LED PROTECTED AREA FOR QIKIQTAIT: THE BELCHER ISLANDS ARCHIPELAGO

Joel P. Heath and Lucassie Arragutainaq

JPH, LA: The Arctic Eider Society, Sanikiluaq, NU, Canada; joel.heath@arcticeider.com
LA: Sanikiluaq Hunters and Trappers Association, Sanikiluaq, NU, Canada

Qikiqtait (the Belcher Islands) archipelago located in the heart of Hudson Bay home to the unique Hudson Bay Common Eider subspecies. The community of Sanikiluaq is working to create an Indigenous-led marine and terrestrial protected area that will protect a variety of key species including protecting eiders throughout their annual cycle, given this species does not migrate. Sanikiluaq has a unique relationship with eiders as showcased in their film People of a Feather. The Arctic Eider Society is an Inuit-led registered charity based in Sanikiluaq and is supporting implementing this vision through a whole-of-community approach. This talk will highlight recent capacity building for infrastructure and community-driven research and monitoring, including the use of SIKU: The Indigenous Knowledge Social Network, a mobile app and project management platform created by AES and used to crowd-source a resource inventory for Qikiqtait, as well as being used across the north by Indigenous communities in Canada, Alaska and Greenland.

B2 - Tuesday, 9 January 2024, 10:45 CST

FIELD TRIP: GITDISDZU LUGYEKS (KITASU BAY) MARINE PROTECTED AREA

Kitasoo Xai'xais Nation

Kitasoo Xai'xais Nation, Klemtu, BC, Canada; kitasooband@gmail.com

The Kitasoo Xai'xais Nation has declared a new Marine Protected Area (MPA) in Gitdisdzu Lugyeks, commonly known as Kitasu Bay. The Nation also released a draft Management Plan for this MPA.

Made by the Hereditary Chiefs of the Kitasoo Xai'xais and supported by Kitasoo Xai'xais elected Chief and Council, the Kitasu Bay MPA Declaration is in accordance with Kitasoo Xai'xais laws, customs, principles, and values, and as the holders of inherent and Aboriginal Title and Rights on our unceded territorial lands and waters.

By establishing Gitdisdzu Lugyeks as an MPA, our Nation is taking an important step toward advancing Indigenous-led conservation. We are reinvigorating our traditional management systems and exercising our inherent and Aboriginal rights, responsibilities, and obligations to steward and manage the territory and resources for current and future generations.

Accompanying the MPA Declaration is a draft Management Plan, which will inform how we will govern and manage the waters and marine resources of Kitasu Bay. The plan outlines the activities that are allowed in the MPA, and which activities are prohibited or restricted. It also outlines the value of the area and why the Nation is protecting it.

Visit: https://klemtu.com/stewardship/protected-areas/gitdisdzu-lugyeks-kitasu-bay-marine-protected-area/

B3 - Tuesday, 9 January 2024, 11:00 CST

CONSERVING SEA DUCK MIGRATION ROUTES THROUGH INDIGENOUS PROTECTED AREAS; KITASOO XAI'XAIS PROTECTION OF A CRITICAL HERRING SPAWN FORAGING AREA SUPPORTS GLOBALLY SIGNIFICANT NUMBERS OF SURF SCOTER

Liam Ragan, Christina Service, and Sandie Hankewich

LR: Important Bird and Biodiversity Areas, BC Nature, Victoria, BC, Canada; iba@bcnature.ca liamragan@redpollconsulting.ca
CS: Kitasoo Xai'xais Stewardship Authority, Kitasoo Xai'xais First Nation, Klemtu, BC, Canada; School of Environmental Studies, University of Victoria, Victoria, BC, Canada

Gitdisdzu Lugyeks, an Indigenous Protected Area of the Kitasoo Xai'xais (KX) Nation (Klemtu, Canada), supports the largest remaining herring spawn on the Central Coast due, in part, to active KX stewardship including negotiated commercial fisheries closures. Drawn to the same herring abundance that support KX traditional harvesters, migrating Surf Scoter (*Melanitta perspicillata*) also use this region as a critical migration stop-over to forage on spawn.
However, over the past decade traditional harvesters have witnessed a stark increase in Surf Scoters aggregating at the spawn, and in response we sought to quantify scoter abundance, arrival timing, and potential foraging impacts on herring spawn. For the 2022 and 2023 herring spawn seasons, project partners KX and BC Nature monitored temporal patterns of a scoter abundance in Gitdisdzu Lugyeks. Additionally, SCUBA surveys documented the corresponding decline in herring egg abundance that correlates to scoter presence and presumed foraging pressure. Surf Scoters aggregation numbers were found to be globally significant with multiple waves of birds and a high daily count of 42,000, equivalent to approximately 9% of the species' entire global estimated population.[1] A previous partial count of scoters in the region and Indigenous Knowledge from KX herring egg harvesters align to suggest that our observed count represents a rapid increase in local scoter abundance. Additionally, current numbers are well in excess of thresholds required for designation of an Important Bird and Biodiversity Area (IBA) and Key Biodiversity Area (KBA) for both Surf Scoters and a number of other bird species, and suggest the disproportionate value of this IPA for migratory Surf Scoters. More broadly, this work serves as an important case study showcasing the critical role of Indigenous Knowledge holders as sentinels of change and the relevance of Indigenous stewardship initiatives in supporting sea duck migration up and down the Pacific Coast.

[1] Partners in Flight. 2021. Avian Conservation Assessment Database, version 2021. Available at http://pif.birdconservancy.org/ACAD. Accessed on September 29, 2023.

B4 - Tuesday, 9 January 2024, 11:15 CST

RANGE-WIDE SPATIAL PATTERNS IN TRENDS AND DISTRIBUTION OF WINTERING AMERICAN COMMON EIDER FROM AERIAL SURVEYS, CITIZEN SCIENCE, AND SATELLITE TELEMETRY

Sarah E. Gutowsky, Mark L. Mallory, Gregory J. Robertson, Nic R. McLellan, Alan Hanson, Scott G. Gilliland

SEG: Department of Biology, Acadia University, Wolfville, NS, Canada;
sarahegutowsky@gmail.com
MLM: Department of Biology, Acadia University, Wolfville, NS, Canada
NRM: Ducks Unlimited Canada, NB, Canada
GJR: Environment and Climate Change Canada, NL, Canada
AH and SGG: Canadian Wildlife Service, Environment and Climate Change Canada, NB, Canada

Few species of sea duck are subject to as many uses, threats, or administrative conflicts as the American common eider (*Somateria mollisima dresseri*), requiring coordinated efforts for effective management. However, *dresseri* eiders have been challenging to manage at a range-wide scale in part due to a lack of consistent monitoring information. Here we provide key insights into spatial patterns in trends and winter distribution for *dresseri* in Canada and the US by combining data from winter aerial surveys flown in Canada 2003-2018 with citizen science data from the Christmas Bird Count (CBC; a winter bird census by volunteers) conducted nearly range-wide 1980-2020, and data from a large-scale, multi-partnered PTT telemetry study initiated in 2021. Surveys and CBCs indicated consistent, widespread declines in local abundance throughout the entire Gulf of Maine and surrounding ecosystems over the past two decades, while trends in the northern and southern extent of the range remained stable or increased, suggesting a redistribution away from the centre of the overwinter range. Of 14 CBC circles in Massachusetts, only two showed steep positive growth, in Cape Cod and the Tuckernuck Islands. Initial PTT results show birds from across the breeding range migrate to winter here, with especially concentrated aggregations around the west end of Nantucket; over three years of tracking 180 females from nesting areas in Maine, New Brunswick, Nova Scotia, Quebec, Newfoundland and Labrador, between 30-90% of birds from each region winter around Cape Cod, with many birds migrating offshore over the Gulf of Maine. Overall, trends and distributions revealed by combining multiple data sources support the notion that Cape Cod and Nantucket Sound are of increasing importance to wintering eiders, since large numbers from across the breeding range continue to congregate here while declines perpetuate to the north along the Atlantic U.S. coast and Maritime Canada.

B5 - Tuesday, 9 January 2024, 13:15 CST

DIVING ACTIVITY OF WINTERING VELVET SCOTERS (MELANITTA FUSCA) IN THE EASTERN BALTIC SEA

Julius Morkūnas, Paola Forni, Rasa Morkūnė, and Ramūnas Žydelis

JM: Lithuanian Ornithology Society, Vilnius, Lithuania; Marine Research Institute, Klaipėda University, Klaipėda, Lithuania; juliusmorkunas@gmail.com
PF, RM: Marine Research Institute, Klaipėda University, Klaipėda, Lithuania
RŽ: Lithuanian Ornithology Society, Vilnius, Lithuania; Ornitela, Vilnius, Lithuania

Velvet Scoter is a relatively large sea duck specializing in feeding on soft bottom bivalves and crustaceans. During winter, distribution of this species is restricted to the eastern and southern Baltic Sea. And it experienced a severe decline during the recent two decades. Scoter habitats are affected by changing climate, nutrients, invasive species and human disturbances such as fishing activities, shipping and wind energy developments. Thus, it is difficult to pinpoint the cause responsible for the recent decline especially when knowledge about winter ecology of this species is limited.

Feeding is the most important activity of wintering sea ducks ensuring survival in harsh winter conditions. Aiming to understand foraging patterns, we fitted 33 Velvet Scoters with external GPS-GSM transmitters equipped with depth sensors enabling to record each dive at 1 second resolution. Transmitters were attached to back feathers using tape and glue. The study was conducted in the eastern Baltic with birds being tracked from December through April.
We quantified diving effort of Velvet Scoters throughout the wintering season, determined dive duration and diving intensity in relation to water depth, assessed presumed feeding efficiency at different depths as time spent at the bottom. Our study represents first empirical measurements of feeding activities of Velvet Scoters in their natural environment throughout the wintering period. The results show large individual variation on preferred feeding depth and time spent underwater. Velvet Scoters can dive to 50 m, but mostly use shallower depths spending on average 90 seconds per dive with total time underwater ranging from 2 to 7.5 hours per day.

B6 - Tuesday, 9 January 2024, 13:30 CST

ESTIMATING NESTING STATUS OF PTT-EQUIPPED AMERICAN COMMON EIDER HENS TO DETERMINE BREEDING PROPENSITY

Asha C. Grewal*, Mark L. Mallory, Scott Gilliland, Nic McLellan, Greg Robertson, Frances E. Buderman, Al Hanson, and Sarah E. Gutowsky

ACG: Department of Biology, Acadia University, Wolfville, NS, Canada; ashagrewal@acadiau.ca
SEG, MLM: Department of Biology, Acadia University, Wolfville, NS, Canada
AH, SG: Canadian Wildlife Service, Environment and Climate Change Canada, NB, Canada
NM: Ducks Unlimited Canada, NB, Canada
GR: Environment and Climate Change Canada, NL, Canada
FB: Department of Ecosystem Science and Management, College of Agricultural Sciences, The Pennsylvania State University, PA, USA

The American common eider (*Somateria mollisima dresseri*) has been declining since ~2000 in the southern portion of their breeding range in eastern North America, where poor recruitment rates have also been observed during the past decade. Diagnosing which vital rates are contributing to population declines is key to delivering effective management programs. Population declines and poor recruitment may be partially attributable to regionally low breeding propensity. To determine the degree of geographic variation in breeding propensity, a large-scale PTT satellite telemetry program was initiated in 2021, with 182 PTT devices deployed in Maine, New Brunswick, Nova Scotia, Quebec, western Newfoundland, and southern Labrador during the spring breeding seasons of 2021, 2022 and 2023. Hens captured on the water near breeding colonies or on the nest were equipped with surgically-implanted PTT devices, with battery life expectations of at least four years due to duty cycles of 17 h off and 2 h on during the nesting period. We now have data from 89 PTT deployments on hens in 2021 and 2022 which have returned to breed in subsequent seasons. However, novel modeling approaches are necessary in order to infer breeding status from movement patterns. Here we present preliminary results of a Bayesian behavioural-switching state-space model, which takes into account elliptical location error and spatial proximity to known nesting sites to estimate the likelihood that hens initiated a nesting attempt in a given breeding season. This work is a critical first step toward determining how geographic variation in breeding propensity may be influencing regional declines in *dresseri* common eiders.

C3 - Wednesday, 10 January 2024, 10:45 CST

GUIDANCE FOR DETECTING CHANGES IN MARINE BIRD DISTRIBUTIONS AND HABITAT USE RELATED TO OFFSHORE WIND DEVELOPMENT IN THE UNITED STATES

Kate Williams, Julia Gulka, Iain Stenhouse, Holly Goyert, Edward Jenkins, Kate McClellan Press, Caleb Spiegel, Tim White

KW, JG, EJ, HG, IS: Biodiversity Research Institute, Portland, ME, USA;
kate.williams@briwildlife.org
KMP: New York State Energy Research and Development Authority, Albany, NY, USA
CS: Migratory Birds Program, U.S. Fish and Wildlife Service–Northeast Region, Hadley, MA, USA
TW: Environmental Studies Program, Bureau of Ocean Energy Management, Sterling, VA, USA

Offshore wind development is rapidly increasing in the U.S. Atlantic, bringing with it a range of potential effects to birds that use the marine environment. For marine birds, the most observed effect of offshore wind energy (OSW) facilities are behavioral changes that lead to avoidance from, or attraction to, these facilities. To ensure site-specific research into this phenomenon is consistent and well-designed, a committee of subject matter experts (under the auspices of NYSERDA's Offshore Wind Environmental Technical Working Group) have developed guidance for conducting studies of changes in bird distributions and habitat use at OSW facilities. The workgroup is chaired by representatives of U.S. federal regulatory agencies and includes experts from the U.S., Canada, and the UK. The guidance document was developed via a combination of literature review of existing guidance and effects studies, power analyses, and expert elicitation. It identifies key research questions regarding displacement, attraction, and macro-to meso-scale avoidance, and provides an overall process for the selection of research questions, focal taxa, and data collection methods. This includes guidance on the strengths and limitations of study methods, and on designing studies to ensure adequate statistical power to detect effects. The guidance also includes specific recommendations for the use of observational surveys (e.g., digital aerial and boat-based surveys), including the use of Before-After Gradient (BAG) designs and other considerations. Finally, recommendations on data consistency and transparency are intended to ensure that the results of site-specific pre- and post-construction monitoring studies are available to inform meta-analyses, cumulative impact assessments, and other large-scale assessments of OSW effects on marine bird populations. The guidance is intended to be used by government and regulatory agencies, offshore wind developers, and other stakeholders to improve the quality of site-specific monitoring efforts and improve our understanding of the effects to marine birds from offshore wind development.

C4 - Wednesday, 10 January 2024, 11:15 CST

QUANTIFYING RISK OF VESSEL ENCOUNTERS WITH SEA DUCKS IN THE NORTH PACIFIC: A MULTI-SCALE SEASONAL ANALYSIS OF ALASKAN OCEANS

Kelly E. Kapsar, Benjamin K. Sullender, and Kathy J. Kuletz

KEK: Department of Fisheries & Wildlife, Michigan State University, East Lansing, MI, USA; kapsarke@msu.edu
BKS: Kickstep Approaches, Anchorage, AK, USA
KJK: US Fish and Wildlife Service (retired affiliate), Anchorage, AK, USA

Alaska's oceans support large commercial fisheries and provide important marine transportation corridors while also hosting vulnerable and threatened sea duck species. Reports indicate that sea ducks are subject to vessel collisions, likely due to disorientation caused by attraction to vessel lights. To evaluate the risk landscape, we used automatic identification system vessel traffic data and distribution data for seven sea duck species obtained from the North Pacific Pelagic Seabird Database. We analyzed overlap between vessels and at-sea sea duck distributions in Alaska during both summer (June-August) and fall (September-November). In summer, highest risk areas were primarily concentrated in the Gulf of Alaska, particularly southeastern Prince William Sound (PWS) and Kachemak Bay. Highest risk areas during fall occurred again in southeastern PWS, but were mostly located along the shipping corridor from the northern Bering Sea and along the eastern Chukchi Sea to Pt. Barrow. Sea ducks were also exposed to elevated levels of nighttime vessel traffic in this Arctic region during fall, when darkness returns and birds are migrating south. These findings can inform spatial management measures designed to reduce risk and injury to sea ducks and other seabirds from vessel activities.

C5 - Wednesday, 10 January 2024, 11:15 CST

TRACKING OF COMMON MERGANSER/GOOSANDER IN SCOTTISH RIVER CATCHMENTS

Anthony S. Wetherhill, David N. Carss, Chris Heward, Liz M. Humphreys, Mark W. Wilson and John Calladine

ASW, MWW, LMH, JC: British Trust for Ornithology Scotland, Stirling, UK;
anthony.wetherhill@bto.org
DNC: UK Centre for Ecology and Hydrology, Roslin, UK
CH: Game and Wildlife Conservation Trust, Perth, UK

Satellite tracking of Common Merganser/Goosander (*Mergus merganser*) was conducted in two river systems in Scotland to understand their ranging behaviour and potential impacts on salmonid fisheries of commercial and conservation importance. Twelve adult female and eight adult male Goosanders were captured and fitted with satellite transmitters during the salmon smolt run period, between March and May in 2021 and 2022, and their movements were monitored. The results showed that Goosanders used a variety of habitats including rivers, lochs, and estuaries, but rivers were the most frequently used habitat type. Home range sizes varied widely among individuals, ranging from 2 km to 60 km of river length. The majority of birds stayed within the river catchments they were caught in, but a few individuals made extensive movements to other river systems in Scotland. In one case a male Goosander migrated to the coast of south-west Norway. Overall, this study provides an initial insight into the ranging behaviour of Goosanders in Scotland, a refinement of capture and tag-fitting methods, and highlights areas where further research is needed to help ameliorate a human-wildlife conflict.

C6 - Wednesday, 10 January 2024, 11:45 CST

MOVEMENT PATTERNS AND RISKS FROM ANTHROPOGENIC STRESSORS FOR SCOTERS WINTERING IN THE SALISH SEA

Megan V. Ross, Joseph R. Evenson, Patrick D. O'Hara, William O'Shea, Matthiew Hamer, Kyle A. Spragens, W. Sean Boyd

MVR, WOS, PDOH, WSB: Environment and Climate Change Canada, Delta, British Columbia, Canada. MVR email: Megan.Ross@ec.gc.ca
JRE, MH, KAS: Washington Department of Fish and Wildlife, Olympia, Washington, USA

Sea ducks (Tribe *Mergini*) interact with human-altered coastlines and marine waterways, exposing them to anthropogenic stressors associated with shipping and recreational vessel traffic. The Salish Sea is a high traffic waterway shared between Canada and the USA that was recently recognized as a Sea Duck Key Site by the Sea Duck Joint Venture. Conservation planners in this region lack high resolution data characterizing daily and seasonal movements of sea ducks during the non-breeding season that could help to reduce risks associated with vessels, such as oil spills. We marked 56 Surf Scoters (*Melanitta perspicillata*) and 33 White-winged Scoters (*Melanitta fusca*) with GPS-GSM transmitters in the Salish Sea in November-December 2021 and 2022. Devices were programmed to collect GPS fixes every ca. 3 hours while birds remained within the Salish Sea, and every 24 hours during spring migration and during the breeding season. Transmitters provided between 6 and 12 months of positional data and ancillary information such as altitude, ground speed and heading. We calculated species-specific, Kernel utilization-based distributions for marked scoters. We identified areas of importance during two distinct time (night, day) and seasonal (winter, spring) periods. We used available Automatic Identification System (AIS) vessel traffic data to explore how scoter core use areas interact with anthropogenic stressors associated with vessel traffic including exposure risk to both operational (smaller scale often intentional discharge) and catastrophic (large scale accidental) oil pollution. We expected that diurnal and nocturnal movement patterns could result in exposure to different risks – exposure to smaller faster vessels and smaller oil spills when nearshore versus exposure to larger vessels, larger oil spills and light pollution in offshore environments. Large transboundary marking efforts such as these are invaluable for effective marine spatial planning and assessing risk in the event of an environmental emergency.

C7 - Wednesday, 10 January 2024, 12:00 CST

EVALUATING THE EFFECTIVENESS OF GULL CONTROL AS A MANAGEMENT TOOL FOR INCREASING COMMON EIDER DUCKLING SURVIVAL

Dustin E. Meattey, Lucas Savoy, Kelsey Sullivan, Brad Allen, Daniel G. McAuley, Robin Dyer, and Chris Dwyer

DEM, LS: Biodiversity Research Institute, Portland, ME, USA; dustin.meattey@briwildlife.org
KS, BA: Maine Department of Inland Fisheries and Wildlife, Bangor, ME, USA
DGM: US Geological Survey (retired), Orono, ME, USA
RD: USDA, APHIS, Wildlife Services, Augusta, ME, USA
CD: US Fish and Wildlife Service, Region 5, Hadley, MA, USA

Duckling survival has been identified as a significant limiting factor for a sustainable population of the American common eider. Although periodic boom/bust cycles in duckling survival and breeding success of females have helped maintain common eider populations in the past, evidence suggests that fewer and/or less frequent years of increased production have occurred within the Gulf of Maine which is necessary for maintaining the eider population. In 2016, a collaborative project among Biodiversity Research Institute, USFWS, Maine Department of Inland Fisheries and Wildlife, and USGS, initiated a pilot study to test the feasibility of marking female eiders with nasal tags and VHF radios and tracking individual broods to determine duckling survival at an important nesting colony in Casco Bay, Maine. We continued to nasal mark and radio tag hens during the 2017-23 seasons and collected additional apparent duckling survival rates during the 2018-23 seasons.

In 2021 we implemented active gull control efforts at the focal eider nesting colony, targeting great black-backed gulls, to evaluate the effectiveness of gull control as a management tool to increase eider duckling survival by comparing apparent survival rates during the pre-treatment and treatment periods. During the 2021 and 2022 seasons, we baited a total of 346 gull nests with DRC 1339, while in 2023 we switched methods to targeted shooting. During the same period (2021-23), we tagged and tracked an additional 60 adult hen eiders to obtain weekly brood counts. We documented a marked increase in eider ducklings surviving to fledge in 2021 compared to 2016-2020 seasons (42% apparent survival in 2021 compared to a previous high of 22%). The 2022 season resulted in extremely low apparent duckling survival (1%), potentially related to especially high rates of HPAI circulating in the environment, providing an indication of the potential severity of HPAI to common eider duckling survival. Survival in 2023 rebounded to 30%, however, we documented 52% apparent survival at a nearby control site with fewer gulls than at the treatment colony.

C8 - Wednesday, 10 January 2024, 12:15 CST

LEAD EXPOSURE CONTINUES TO THREATEN SPECTACLED EIDERS ON THE YUKON-KUSKOKWIM DELTA DESPITE THREE DECADES OF PROTECTION UNDER THE ENDANGERED SPECIES ACT

Daniel Rizzolo, Paul Flint, Kate Martin, and Neesha Stellrecht

DR, NS: Ecological Services, US Fish and Wildlife Service, Fairbanks, AK, USA; daniel_rizzolo@fws.gov
PF: Alaska Science Center, US Geological Survey, Anchorage, AK, USA
KM: Migratory Bird Management, US Fish and Wildlife Service, Anchorage, AK, USA

We examined rates of lead exposure (blood lead > 0.2 ppm) in Spectacled Eiders on the Yukon-Kuskokwim Delta using blood samples collected during the breeding season 2018–2022 to compare with rates measured in the 1990s. In the 1990s, eiders were exposed to lead from spent shotgun pellets ingested while feeding in ponds with an estimated regional exposure rate of 11.8% and observed local exposure rates ranging 3–28%. We expected exposure rates to have declined given that in the decades since lead exposure was last examined, regulations prohibiting the use of lead shotgun ammunition have been in place, outreach and lead-for-steel ammunition exchange programs have been implemented, and experimental studies indicated that previously deposited lead pellets likely have settled in ponds and become unavailable to feeding eiders. Contrary to our expectation, lead exposure rates measured in 226 blood samples collected from 3 sites remained similar to those observed in the 1990s indicating continued illegal use of lead ammunition during the past decade and/or that lead pellets remain available to feeding eiders for very long periods of time. The temporal pattern of exposure was similar to the 1990s with exposure rate increasing with time spent on the breeding area. These results indicate the regulation of lead shotgun ammunition has likely been ineffective and lead poisoning likely continues to impact Spectacled Eiders despite 30 years of protection under the Endangered Species Act.

C10 - Wednesday, 10 January 2024, 12:45 CST

MOVEMENT ECOLOGY OF GREATER SCAUP THAT WINTER IN SOUTHERN NEW ENGLAND

Tori Mezebish Quinn*, Peter Paton, Jennifer Kilburn, Scott McWilliams

TMQ, PP, SM: University of Rhode Island, Kingston, RI, USA; tmezebish@uri.edu
JK: Rhode Island Department of Environmental Management, Division of Fish and Wildlife, West Kingston, RI, USA

Greater scaup (*Aythya marila*) are a circumpolar diving duck that breed in tundra habitats and winter in coastal areas along both North American coasts where human development exposes the species to anthropogenic pressures. The overall goals of this project are to quantify the effects of environmental and anthropogenic factors on the seasonal and annual movements and habitat selection of greater scaup wintering in Southern New England's coastal waters. During February and March 2023, we deployed 28 implanted GPS-GSM transmitters in greater scaup in coastal Rhode Island (adult males: n = 16, juvenile males: n = 1, adult females: n = 9, juvenile females: n = 2). Twenty individuals provided data through initiation of spring migration. Individuals remained in Southern New England for on average 24 days following release (range = 3 – 43 days) during which they often moved up to 15 km among multiple large congregations of scaup in protected harbors and inlets in northern Narragansett Bay. Mean spring migration initiation date was 22 March 2023 (range = 7 March –9 April 2023) and individuals were tracked for 42 days on average (range = 11 – 71 days) during spring migration before migrating beyond cellular networks. Spring migration paths varied among individuals, with 4 migrating along the eastern maritime states and provinces, 3 migrating through the intermountain lakes of New England with stops at Lake Champlain, USA and the St. Lawrence River, QC, and 13 migrating through the Great Lakes region before continuing northwest. Future project plans include quantifying the relative influence of anthropogenic factors on the winter habitat selection and annual cycle phenology of Southern New England's greater scaup. This research will inform management strategies that minimize potential human conflict for greater scaup and sea duck species that winter in coastal estuaries.

C11 - Wednesday, 10 January 2024, 12:50 CST

ASSESSING THE ROLE OF OVER-WINTERING MARINE SITES IN SUPPORTING DECLINING SURF SCOTERS (*MELANITTA PERSPICILLATA*) IN THE SALISH SEA

Olivia MC. Trudeau* and Eric M. Anderson

OMCT, EMA: Ecological Restoration Program, Simon Fraser University & British Columbia Institute of Technology, Burnaby, B.C; o_trudeau@hotmail.com

Surf Scoters (*Melanitta perspicillata*) are a sea duck species of conservation concern, yet reasons behind their precipitous population decline remain poorly understood. Given the relative importance of winter-feeding conditions to Surf Scoters, I investigated whether changes in progressively urbanized feeding sites in the Salish Sea may be limiting their survival and recovery. First, I compared changes in body condition using body mass and plasma triglyceride metrics between two time periods (2001-2008 versus 2021-2022) and across over-wintering sites characterized by distinct feeding habitats: (1) mixed-hard bottom sites dominated by Bay mussels (*Mytilus trossulus*), (2) soft-bottom sites with eelgrass, and (3) soft-bottom unvegetated sites. Second, I assessed the relationship between Surf Scoter abundance and mussel density at a feeding site heavily used by scoters in early winter. Seasonal changes in body mass and plasma triglycerides were evident, and suggest that mixed-hard bottom, mussel-dominated sites are an important feeding habitat for Surf Scoters in early winter. I found no significant difference in scoter body mass among past and present time periods and found no significant relationship between Surf Scoter abundance and mussel density across years, suggesting that Surf Scoter body condition is resilient to some changes in feeding profitability. In addition, results from my mussel surveys did not suggest that the 2021 heat dome had a considerable effect on mussel density. Thus, my results suggest that variation in feeding profitability at wintering sites in the Salish Sea is unlikely to have been a key contributor to long-term population declines. However, I propose that there may be a threshold beyond which declines in winter feeding conditions could constrain Surf Scoter population dynamics. Other stressors occurring within wintering areas (e.g., pollution, direct human disturbance) or factors occurring outside of the winter period (e.g., breeding habitat loss and degradation) may be contributing to Surf Scoter declines. This work highlights the need for additional research, monitoring, and conservation efforts focused on protecting vital nearshore marine habitats in the Salish Sea.

In collaboration with the Canadian Wildlife Service & Washington Department of Fish & Wildlife, with financial support from Birds Canada and the Mitacs Accelerate program.

C12 - Wednesday, 10 January 2024, 13:15 CST

VISIBILITY CORRECTION FACTORS FOR MULTIPLE SPECIES OF WATERFOWL USING AN AERIAL REMOTE SENSING APPROACH

Luke J. Fara, William Beatty, Mark Koneff, Drew Fowler, Taylor Finger, Kyle Landolt, Benjamin Finley, Janis Ruhser, Brian Gray, Steven Houdek, Aaron Wright, and Greg Marchel

LJF, WB, KL, BF, JR, BG, and SH: U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, WI, USA; lfara@usgs.gov
MK: U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Orono, ME, USA
DF: Louisiana State University, Louisiana Cooperative Fish and Wildlife Research Unit, Baton Rouge, LA, USA
TF and AW: Wisconsin Department of Natural Resources, Bureau of Wildlife Management, Madison, WI, USA
GM: Wisconsin Department of Natural Resources, Aeronautics Team, Oshkosh, WI, USA

Aerial ocular surveys are a cost and time-efficient method to evaluate the relative abundance and spatial distributions of waterfowl. However, many ocular survey methods are subject to substantial visibility bias and correction factors must be calculated for incomplete detection. Calculation of visibility correction factors in remote or hard to access places, such as open water environments, is difficult but new technologies offer a means to estimate them. During fall 2021, we used the advanced remote sensing capabilities of the U.S. Fish and Wildlife Service - Division of Migratory Bird Management and Wisconsin Department of Natural Resources ocular survey crew to collect data to estimate visibility correction factors for waterfowl staging on the Wisconsin waters of Green Bay, a sub-basin of Lake Michigan. During two and half flight missions we captured high-resolution digital imagery (e.g., 1-1.5 cm) at 305 meters above ground level in one plane, while a second plane followed along the same transect conducting a blind double observer ocular survey at 61 meters above ground level. Avian targets within the collected imagery will be annotated to the lowest possible taxonomic level (e.g., species) and used to estimate visibility correction factors, along with associated uncertainties at different spatial and temporal scales for multiple species of waterfowl. In addition, annotated imagery will be incorporated with existing databases for training machine learning algorithms that would automate enumeration and classification of targets from remotely sensed data. Estimation of visibility correction factors, leading to more accurate estimates, is important for agencies that are conducting aerial surveys over open water environments to assess waterfowl abundance and distributions during the non-breeding time period.

C13 - Wednesday, 10 January 2024, 13:30 CST

MACHINE LEARNING INSIGHTS INTO NEST SITE SELECTION BY ARCTIC TUNDRA SEA DUCKS: A MULTISPECIES AND MULTISCALE PERSPECTIVE

Micah W. C. Miller, James R. Lovvorn, Nathan R. Graff, Neesha C. Stellrecht, Mark J. Lara, and Christian Andresen

MWCM, JRL: Southern Illinois University, Carbondale, IL, USA
MWCM, NRG, NCS: Northern Alaska Field Office, US Fish and Wildlife Service, Fairbanks, AK, USA
MWCM current: Biodiversity Research Institute, Portland, ME, USA; micah.miller@briwildlife.org
MJL: University of Illinois, Urbana, IL, USA
CA: University of Wisconsin, Madison, WI, USA

How animals select habitats for various aspects of their annual cycle is a fundamental driver of survival and reproductive success. For long-lived migratory birds, choice of nest sites likely involves a broad diversity of cues in an often rapidly changing environment. Such decisions occur at multiple spatial scales, and among abiotic, vegetative, and social components of the landscape. Over three decades (1991–2022), we located 1600 nests of four species of sea ducks breeding in lowland tundra of the Alaskan Arctic: long-tailed ducks (*Clangula hyemalis*) and Steller's (*Polysticta stelleri*), spectacled (*Somateria fischeri*), and king (*S. spectabilis*) eiders. We compared habitat characteristics around nests with random locations to assess site selection among years at six spatial scales from ~1 m to 2750 m away from nests. Our use of machine learning models for each duck species allowed us to consider an exceptionally wide range of habitat characteristics at multiple scales, while avoiding the parametric constraints and assumptions of linear relationships inherent in commonly used resource selection functions. Our results indicate that suitable habitats comprised a small fraction of total area that varied considerably in location while changing little in total extent among years. Fine-scale spatial relationships with other birds, especially with other nesting ducks, were consistently important for defining suitable habitat for all the study species, and were more influential than physical or other ecological features. Thus, nesting habitat assessments must consider the local community of birds as well as the focal species. As these tundra nesting habitats are impacted by climate change and other anthropogenic factors including petroleum development and urban expansion, conservation for these sensitive sea duck species should include broad areas that encompass annual shifts in the spatial mosaic of suitable nesting habitats.

D1 - Thursday, 11 January 2024, 10:05 CST
Plenary

LONG-TERM ENVIRONMENTAL DATA: WHERE TO GET THEM AND WHAT TO LOOK FOR

David Douglas

DD: US Geological Survey Alaska Science Center, Anchorage, AK, USA; ddouglas@usgs.gov

The ability to acquire long-term environmental data at specific areas and on specific dates has become remarkably efficient over the past decade. A growing number of servers are providing end-users with tools that deliver spatial, temporal, and thematic subsets of long-term global datasets that are often too large to download in their entirely. Three sources that I have found to be especially useful are: 1) Europe's Copernicus services (https://www.copernicus.eu/); 2) NOAA Coastwatch's ERDDAP interfaces (https://coastwatch.pfeg.noaa.gov/erddap/); and 3) Movebank's Env-DATA tool (https://www.movebank.org/). Popular long-term ocean data include metrics such as sea surface temperature, productivity (Chl-a), currents and sea ice, while several global reanalysis data sets provide a variety of high temporal frequency (1–6 hour) weather variables such as air temperature, wind, precipitation, and snow. The weather and sea surface temperature data date back to the 1980s or earlier while most other ocean metrics commence around the year 2000. As climate warming imposes a new era of unprecedented environmental disequilibrium, it is crucial to better understand how species, food webs, and ultimately ecosystems will respond if science is to have an effective role in adaptation. Analyzing species responses to contemporary environmental conditions, and with respect to conditions of prior decades, will help formulate important mechanistic hypotheses that future studies can test, refine, and ultimately use for developing adaptation strategies.

D3 - Thursday, 11 January 2024, 10:45 CST

PACIFIC COMMON EIDER NESTING SUCCESS IN ARCTIC ALASKA: EVALUATING THE CONSEQUENCES OF BARRIER ISLAND CHANGE

Kayla A. Shively, Rebecca L. McGuire, and Martin Robards

KAS, MR: Wildlife Conservation Society Arctic Beringia Program, Fairbanks, AK, USA; kshively@wcs.org
RLM: ABR Environmental Research & Services, Fairbanks, AK, USA

The Arctic coastline is undergoing rapid and accelerating change in response to climate warming, altering ecosystem function. For species spending their life cycles in remote habitats, our understanding of the consequences of environmental changes remains limited. Pacific Common Eiders breeding on barrier islands in Arctic Alaska are under threat from sea level rise, increased storm surges that overwash islands during the nesting period, and changing predator communities. To address these risks, the Wildlife Conservation Society began a nest monitoring study on barrier islands in the Chukchi Sea. During four summers between 2016 and 2023, islands bordering the Kasegaluk Lagoon were censused for nesting eiders. During which, reproductive metrics and micro-site variables were recorded. We examine the effects of varying nest site characteristics on Common Eider reproductive parameters to better understand how current and projected changes to barrier island nesting grounds will affect breeding productivity. We contextualize our findings with prior surveys in this region and similar studies along the Beaufort Sea coastline. We highlight an expansive existing body of knowledge regarding Pacific Common Eider breeding ecology on Alaska's Arctic Coast and the urgent need to synthesize and disseminate this knowledge to researchers, policy makers, and stakeholders.

D4 - Thursday, 11 January 2024, 11:00 CST

SITTING DUCKS: PHYSIOLOGICAL AND BEHAVIOURAL RESPONSES OF INCUBATING EIDERS FACING THERMAL STRESS IN THE CANADIAN ARCTIC

Emily C. MacDonald*, Christina A. D. Semeniuk, H. Grant Gilchrist, and Oliver P. Love

ECM: Department of Integrative Biology, University of Windsor, Windsor, ON, Canada; macdon85@uwindsor.ca
OPL, CADS: Department of Integrative Biology, University of Windsor, Windsor, ON, Canada
HGG: Northern Conservation Division, National Wildlife Research Centre, Environment and Climate Change Canada, Ottawa, ON, Canada

Rising ambient temperatures driven by climate change may increase endotherms' risk of thermal stress, proximately impacting their physiology and behaviour, and ultimately, fitness. Cold-specialist species may be particularly at risk of over-heating, as they adaptively retain heat to survive cold environments. Within this framework, I am examining changes in heart rate (proxy for metabolic demand) and incubation behaviour of nesting common eiders (*Somataria mollissima*) - an arctic-breeding sea duck that fasts during their ~25-day incubation on sun- exposed nests - as a response to thermal stress and overheating. In the summers of 2019, 2022, and 2023, we substituted one egg with a previously validated 3D-printed replica containing a heart rate recording microphone in focal nests (N = 62; n= 12, 14 and 36, respectively) during laying at a long-term breeding colony in the East Bay (Qaqsauqtuuq) Migratory Bird Sanctuary, Nunavut. We also recorded incubation behaviour with in-nest thermal probes and collected ambient/radiative temperatures using weather monitoring equipment at each nest site and across the island, with each year differing in their maximum seasonal ambient temperatures attained (19.8^{o}C – 26.7^{o}C). We will be examining the relationship between variation in environmental parameters, heart rate (i.e., metabolic energy expenditure) and incubation behaviour (nest-attendance and agitation) within and between years to determine whether incubating eider hens are thermally stressed. My findings will characterize the direct impacts of climatic warming on the energetic and behavioural costs of breeding in a cold-adapted sea duck, thus providing insight into their vulnerability of over-heating and informing timely management strategies.

D5 - Thursday, 11 January 2024, 11:15 CST

CONTRASTING INFERENCES FROM DIFFERENT DATA TYPES WHEN EVALUATING BARROW'S GOLDENEYE POPULATION DELINEATION

Dan Esler and W. Sean Boyd

DE: Alaska Science Center, US Geological Survey, Anchorage, AK, USA; desler@usgs.org
WSB: Environment and Climate Change Canada, Delta, BC, Canada

Delineation of populations into units that are meaningful for management or are evolutionarily significant has been an important topic in wildlife conservation, including for sea ducks. Numerous techniques have been applied to understanding sea duck population delineation, including direct measures of dispersal and migratory connectivity, using tracking devices and band recoveries, and methods that measure the potential results or indicators of those movement processes, such as genetics, morphometrics, and stable isotopes. Most of these data types have been collected for Barrow's Goldeneyes (*Bucephala islandica*), which allows for an unusual opportunity to compare the inferences derived from each. Several lines of evidence indicate that populations are discrete at a continental scale (i.e., Pacific North America, Atlantic North America, and Iceland), as well as differentiated into subpopulations within the Pacific range, which constitutes the vast majority of the global population. These data include band recoveries, movements based on satellite telemetry, and mitochondrial DNA. Conversely, morphometric measures and nuclear DNA do not differ across the species range. We conclude that Barrow's goldeneyes can be delineated into subpopulations that are largely demographically independent and meaningful as management units, and offer interpretations why not all data types are consistent.

D6 - Thursday, 11 January 2024, 11:45 CST

RECENT DECLINES IN POPULATION INDICES FOR SPECTACLED EIDERS ON BOTH BREEDING AREAS IN ALASKA

David E. Safine, Erik E. Osnas, Charles Frost, Heather M. Wilson, Michael A. Swaim and Julian B. Fischer

DES, EEO, CF, HMW, MAS, JBF: Migratory Bird Management, US Fish and Wildlife Service, Anchorage, AK, USA; david_safine@fws.gov

Spectacled eiders breed in three primary locations: the Yukon-Kuskokwim Delta (YKD) and the Arctic Coastal Plain (ACP) of Alaska, and Arctic Russia. In 1993, the species was listed as Threatened under the U.S. Endangered Species Act primarily due to a rapid population decline on the YKD. After listing and until ~2010, there was an increase in the YKD population (as observed in the YKD Coastal Zone Aerial Survey indicated total bird index). At times the population was increasing at up to 8% per year. After 2010, the population appeared to stabilize, recently (2021-2023), the index was down >50% from its high point. In contrast, the ACP breeding population (as observed in the ACP breeding pair aerial survey) has been stable to slightly declining since listing, but similar to the YKD, the indicated total bird index dropped considerably in recent years (2022 and 2023; no data in 2020 or 2021). Aerial survey design and implementation factors will also be discussed. Ground-based transect surveys for nests on the YKD in 2022 indicated about half the number of nests compared to recent plot-based surveys. The recent declines in breeding pair and nest indices on the YKD and ACP are concerning, and push this species further from achieving recovery criteria. Causes of the recent decreases are unknown but may include reduced breeding effort, population size, or changes in distribution.

D7 - Thursday, 11 January 2024, 12:00 CST

CROSS-SEASONAL EFFECTS IN A SEA ICE-ASSOCIATED SEA DUCK: DO WINTER CONDITIONS AFFECT BREEDING SPECTACLED EIDERS?

Randall J. Friendly*, Mark Lindberg, Todd Brinkman, Christa Mulder, Daniel J. Rizzolo

RJF, ML, TB, and CM: Department of Biology and Wildlife, University of Alaska Fairbanks, Fairbanks, Alaska, USA
rjfriendly2@alaska.edu
DJR: Northern Alaska Fish and Wildlife Field Office, US Fish and Wildlife Service, Fairbanks, Alaska, USA

Climate change in the Arctic is occurring more rapidly than anywhere on the globe and the changes in the marine environment can impact the distribution and abundance of Arctic and sub-Arctic species. Understanding how a species responds to climate change can aid conservation planning and recovery. Spectacled eiders (*Somateria fischeri*), a threatened species, winter in the Bering Sea and nest along coastal areas of Alaska and Arctic Russia. The severity of winter conditions in the Bering Sea has been associated with both reduced annual survival and reduced breeding abundance and may have sublethal effects during the breeding season. In this study, we used long-term nest monitoring data from Kigigak Island and Utqiaġvik to examine the hypothesis that winter conditions in the Bering Sea influence the reproductive performance of eiders in the following breeding season. For both sites, we examined the effects of winter ice conditions and spring temperature and wind on nest initiation date, clutch size, and nest survival. Nest initiation date was not strongly associated with conditions experienced prior to the breeding season and the difference in mean initiation date between sites was 20 days. We found no evidence that winter and spring conditions preceding the breeding season explained variation in clutch size, suggesting that breeding propensity may buffer against carryover effects on clutch size. Nest survival varied by year site. Low ice cover during winter was associated with lower nest survival and moderate to high ice cover was associated with higher nest survival. We speculate that low sea ice winters reduce nest survival through negative effects on body condition. Negative effects of changing ice conditions on multiple demographic rates may lead to future population declines for spectacled eiders at rates higher than previously predicted.

D8 - Thursday, 11 January 2024, 12:15 CST

PREY AVAILABILITY AND FORAGING ACTIVITY BY TUNDRA-NESTING SEA DUCKS: STRONG PREFERENCE FOR SPECIFIC WETLAND TYPES

Micah W. C. Miller, James R. Lovvorn, Nathan R. Graff, Neesha C. Stellrecht, and Steven P. Plesh

MWCM, JRL, SPP: Southern Illinois University, Carbondale, IL, USA
MWCM, NRG, NCS: Northern Alaska Field Office, US Fish and Wildlife Service, Fairbanks, AK, USA
MWCM current address: Biodiversity Research Institute, Portland ME; micah.miller@briwildlife.org

Wetlands in Arctic tundra support abundant breeding waterbirds. Wetland types differing in area, depth, vegetation, and invertebrate biomass density may vary in importance to birds, and in vulnerability to climate change. We studied availability and use of different wetland types by pre-laying females of four species of sea ducks (Mergini) breeding on the Arctic Coastal Plain of Alaska, USA: long-tailed ducks (Clangula hyemalis) and Steller's (*Polysticta stelleri*), spectacled (*Somateria fischeri*), and king eiders (*Somateria spectabilis*). All four species preferred shallow vegetated wetlands versus deeper lakes. The ducks spent almost all their active time feeding, but their occurrence in different wetland types was not affected by the relative biomass density of known prey or of all invertebrates that we sampled combined. Sea ducks strongly preferred wetlands dominated by emergent and submersed *Arctophila fulva* over those dominated by the sedge *Carex aquatilis*, despite the much greater number, total area, and invertebrate biomass density of *Carex* wetlands. The hens depend heavily on local invertebrate prey for protein to produce eggs; thus, their preference for *Arctophila* wetlands likely reflects greater accessibility of prey in the near-surface canopy and detritus of *Arctophila.* Such shallow wetlands decreased substantially in number (−17%) and area (−30%) over 62 years before 2013 and appear highly susceptible to further declines with climate warming. Impacts on sea ducks of climate-driven changes in availability of important wetland types will depend on their adaptability in exploiting alternative wetlands.

D10 - Thursday, 11 January 2024, 12:45 CST

ORGANIC MATTER SOURCES AND FLOWS IN TUNDRA WETLAND FOOD WEBS

Steven P. Plesh*, James R. Lovvorn, and Micah W. C. Miller

SPP, JRL , MWCM: Zoology Program and Center for Ecology, School of Biological Sciences, Southern Illinois University-Carbondale, Carbondale, IL USA; steven.plesh@siu.edu

Arctic lowland tundra is often dominated by wetlands that support various breeding waterbirds, including sensitive populations of sea ducks. As numbers and types of these wetlands change with climate warming, availability of their invertebrate assemblages to breeding sea ducks may be negatively impacted. Increased influx of nutrients and dissolved organic matter from thawing peat may alter the relative availability of organic matter (OM) sources, differentially affecting taxa with disparate dependence on those sources. In five shallow wetland types (>110 cm deep) and in deeper lakes (>150 cm), we used stable isotopes ($\delta^{13}C$, $\delta^{15}N$) to compare contributions of four OM sources (periphytic microalgae, cyanobacteria, macrophytes, peat) to the diets of nine macroinvertebrate taxa. Our results indicate that invertebrate assemblages depended heavily on consumption of microalgae in all wetland types (39–82% of OM contributions, mean 59%) except deeper lakes (20–62%, mean 31%). Abundance of nutrients, light, and CO2 from bacterial respiration is expected to remain high in these shallow arctic ponds; thus, prominence of microalgae in these food webs will likely be unchanged. We also investigated differences in invertebrate community structure and biomass among these wetland types. Wetlands dominated by *Arctophila* and *Carex* had the greatest evenness among taxa, compared to Streams or Deep Open Lakes. Although relative use of OM sources was similar across wetland types, total invertebrate biomass was much higher in shallow wetlands with emergent vegetation (*Carex* or *Arctophila*). From 1948 to 2013, such wetlands decreased by 17% in number and 30% in area. Our results suggest that impacts of warming on the availability of invertebrate prey to sea ducks will likely depend not on shifts in OM sources, but more on changes in overall number or area of shallow emergent wetlands.

D11 - Thursday, 11 January 2024, 12:50 CST

CHANGING FORAGE CONDITIONS FOR MOLTING STELLER'S EIDERS (POLYSTICTA STELLERI) IN IZEMBEK LAGOON, ALASKA

Anastasia M. Maliguine*, Tuula E. Hollmen, Courtney L. Amundson, and Brenda H. Konar

AMM, TEH, BHK: College of Fisheries and Ocean Sciences, University of Alaska Fairbanks, Fairbanks, AK, USA; ammaliguine@alaska.edu
TEH: Alaska SeaLife Center, Seward, AK, USA
CLA: US Department of Agriculture, AK, USA

Izembek Lagoon, located in the Alaskan southern Bering Sea, is designated as critical molting and wintering habitat for the Alaska-breeding population of Steller's eiders (*Polysticta stelleri*), listed as Threatened under the United States Endangered Species Act. Izembek Lagoon is also an important stopover site for many other species of migratory water birds. Since the early 1980s, there has been a decline of Steller's eiders in their known nonbreeding range in the southern Bering Sea, but especially in Izembek Lagoon where eiders undergo their remigial molt during the fall. The cause of this decline is unknown, however, in recent years higher sea temperatures have been observed in Izembek Lagoon and warming ocean temperatures have been associated with shifts in benthic community structure elsewhere. If forage conditions are less favorable in Izembek Lagoon, eiders may redistribute to other locations or the population at Izembek Lagoon may decline. Therefore, in 2018 and 2019, we replicated a benthic sampling effort conducted by the United States Geological Survey in 1998 to understand if prey availability could be less favorable to eiders during their molt in Izembek Lagoon. We compared forage conditions based on the relative biomass (%) and overall biomass (g/m^2) of marine benthic groups: Bivalvia, Gastropoda, Crustacea, and Polychaeta, and compared size (mm) of organisms belonging to these groups between the two time periods. Our results suggest a shift in benthic community composition and change in biomass and size of benthic prey. The community shifted from being dominated by bivalves in 1998 to predominantly polychaetes in 2018 and 2019. In addition to a reduction of bivalve biomass in 2019, bivalves and gastropods were significantly smaller. This study provides a contemporary assessment of forage conditions in a critical habitat for Steller's eiders.

D12 - Thursday, 11 January 2024, 13:15 CST

OPTIMIZING SEA DUCK RESEARCH: COMPUTER VISION-BASED BEHAVIOR AND NEST SURVIVAL ANALYSIS

Lindsay Veazey, Tuula Hollmen, and Chris Latty

LV, TH: University of Alaska Fairbanks, Fairbanks, AK, USA; lmveazey@alaska.edu
CL: US Fish and Wildlife Service, Arctic National Wildlife Refuge, Fairbanks, AK, USA

Rapidly developing data storage technologies allow scientists to collect massive amounts of high-quality imagery of incubating sea ducks. While these data are rich with potential insights, manual review can be cumbersome and slow. We have developed a proof-of-concept computer vision pipeline to accelerate analyses of common eider (*Somateria mollissima*) incubation behavior. The model is trained on images of common eiders from nest camera recordings taken around the North Slope of Alaska. Our model can identify and track the coordinate-based onscreen movements of female common eiders in novel videos with over 99% accuracy, which automates measurements of incubation constancy. The coordinate-based tracking capability of the model allows us to categorize probable behaviors based on anatomical changes (*e.g.,* threatened head posturing, actively incubating, flushing). This approach is a promising first step towards creating methods that can be applied to process imagery data for eiders and other sea duck species. We plan to build on this project by testing how the model performs on imagery where birds are filmed at various differences from the recording device.

D13 - Thursday, 11 January 2024, 13:30 CST

ECOLOGICAL FACTORS DRIVE INTERANNUAL VARIATION OF SEA DUCK RECRUITMENT RATES

Jacob Hewitt*, Jason N. Straub, and Anthony J. Roberts

JH, JNS: State University of New York-Brockport, Brockport, NY, USA; hewittj4114@gmail.com
AJR: Division of Migratory Bird Management, US Fish and Wildlife Service, Laurel, MD, USA

Components of breeding productivity and survival rates in avian populations respond to dynamic environmental stressors across the annual cycle, which therein shape population dynamics over time. In sea ducks (Tribe Mergini), few studies have characterized the ecological factors that drive annual recruitment trends at the population level over time due to scarce scalable population information. Here, I leveraged historic harvest survey recruitment estimates (juvenile proportions) and indicators of environmental conditions at breeding, staging, and wintering areas from 1980-2017 to investigate factors influencing annual recruitment rates in eastern North American populations of Long-tailed Ducks (*Clangula hyemalis*), Black Scoters (*Melanitta americana*), White-winged Scoters (*M. delgandi*) and Surf Scoters (*M. perspicilatta*). Recruitment rates in multiple species were positively associated with mean ambient temperatures at staging and breeding areas during spring. This supported my hypothesis that pre-nesting ice cover in key habitats limits breeding productivity by delaying breeding phenology and causing declines in female body condition. Surf Scoter recruitment had a strong negative association with Great Gray Owl (*Strix nebulosa*) irruptive migrations, suggesting surf scoters experience intensified predation pressure during low phases of vole population cycles and incur lower nest and brood survival rates. North Atlantic Oscillation patterns and staging area mean ambient temperatures in autumn showed associations with sea duck recruitment, suggesting harsh weather conditions post-fledging may precipitate early migratory movements that reduce juvenile survival rates or elicit greater proportions of adult sea ducks in subsequent harvests. My findings highlight important relationships between sea duck annual recruitment and ecological factors that may have considerable consequences for sea duck populations as ecosystems and climatic patterns undergo significant changes in the future.

Red Breasted Merganser at Point Lobos by Robert Steiner

ABSTRACTS FOR POSTER PRESENTATIONS

P1 - Tuesday, 9 January 2024, 11:45 CST
Poster

CHARACTERIZATION OF THE MIGRATORY PATTERNS, TIMING, CONNECTIVITY, AND SITE FIDELITY OF THE WESTERN NORTH AMERICAN HARLEQUIN DUCK (HISTRIONICUS HISTRIONICUS) POPULATION THROUGHOUT THE ANNUAL CYCLE

Andrew Annanie*, David Douglas, W. Sean Boyd, Joseph Evenson, Lisa Bate, Beth MacCallum, Lucas Savoy, and Chris Hammond

AA: Western Washington University, Bellingham, WA, USA; annania@wwu.edu
DD: US Geological Survey, Alaska Science Center, Juneau, AK, USA
WSB: Environment and Climate Change Canada, Pacific Wildlife Research Center, Delta, BD, Canada
JE: Washington Department of Fish and Wildlife, Seattle, WA, USA
LB: National Park Service, Glacier National Park, West Glacier, MT, USA
BM: Bighorn Wildlife Technologies Ltd., Hinton, AB, Canada
LS: Biodiversity Research Institute, Portland, ME, USA
CH: Montana Fish, Wildlife, and Parks, Kalispell, MT, USA

The Harlequin Duck (*Histrionicus histrionicus*) is described in the Sea Duck Joint Venture's 2022-2031 strategic plan as a species of management concern and a high priority for study and conservation. Population assessment and delineation, as well as seasonal distributions and habitat associations, were ranked high priority focal areas in need of attention. To enhance our understanding of Harlequin duck population and movement ecology, biologists from federal, state, and non-governmental organizations in the United States and Canada undertook a collaborative project to track Harlequin duck movements with internally implanted satellite transmitters. Beginning in 2014 and concluding in 2019, this collaboration resulted in the instrumentation of 99 male and 20 female Harlequin ducks from across Alberta, British Columbia, Montana, Washington, and Wyoming. A supplemental historic (2001-2003) dataset of birds captured in Prince William Sound, Alaska, added an additional 13 male birds. The tracking data were used to chronicle and map migration routes and geographic regions of significance that serve as breeding, wintering, moulting, and stop-over habitats, as well as to document the prevalence of site fidelity. Migration timing, while highly variable among individuals, exhibited consistencies when summarized within and between capture regions. A high degree of site fidelity was observed across all major annual life cycle stages, both within and between years. Data from tagged breeding pairs showed that paired birds spent a significant amount of time together, upwards of 200-300 consecutive days. Assessment of migratory connectivity between breeding and moulting, moulting and wintering, and breeding and wintering sites are currently ongoing, as are applications of generalized linear modeling to examine how migration timing across years may be related to latitude, longitude, elevation, and distance traveled, as well as synoptic weather conditions as indexed by the Pacific North American Pattern, the Arctic Oscillation, and the El Niño Southern Oscillation.

P2 - Tuesday, 9 January 2024, 11:45 CST
Poster

COMMON EIDER *SOMATERIA MOLLISSIMA* UNDER PRESSURE FROM ENDOCRINE DISRUPTING CHEMICALS

Céline Arzel, Amalie Ask, Farshad Sajjad Vakili, Prescillia Lemesle, Sunniva H. Frøyland, Elise Lunde, Silje Peterson, Anne-Fleur Brand, Junjie Zhang, Tomasz M. Ciesielski, Alexandros G. Asimakopoulos, Kristina Noreikiene, Bin-Yan Hsu, Suvi Ruuskanen, Juho Jolkkonen, Titiksha Peetumber, Nora M. Wilson, Stefan Björkman, Christian Sonne, Sanna Koivisto, Markus Öst, Kim Jaatinen, Bertille Mohring, Jón Einar Jónsson, Martin Hansen and Veerle Jaspers

CA, AA, FSV, BYH, TP: Department of Biology, University of Turku, Finland; celine.arzel@utu.fi
PL, SHF, EL, SP, AFB, JZ, TMC, AGA, VJ : Department of Biology, Norwegian University of Science and Technology (NTNU), Trondheim, Norway
KN: Institute of Veterinary Medicine and Animal Sciences, Estonian University of Life Sciences, Tartu, Estonia
SR, JJ: Department of Biological and Environmental Science, University of Jyväskylä, Finland
NMW: Faculty of Science and Engineering, Åbo Akademi University, Turku, Finland
SB: Faculty of Veterinary Medicine, University of Helsinki, Finland
CS, MH: University of Aarhus, Denmark
SK: Finnish Safety and Chemicals Agency, Finland
MO, BM: Environmental and Marine Biology, Åbo Akademi University, Finland
KJ: Nature and Game Management Trust Finland, Finland
JOJ: University of Iceland's Research Center at Snæfellsnes, Iceland

The increased presence of endocrine disrupting chemicals (EDCs) in our environment poses a significant threat to wildlife, particularly in the Baltic region, where the Common Eider (*Somateria mollissima)* population has been declining in recent decades. While predation plays a significant role in this decline, other stressors may also contribute to this process. Notably, there is a growing sex ratio bias towards males in the adult Eider population, and some breeding colonies may show significant hatching failure of up to 43% of eggs, as recorded in 2020 at the Bengtskär colony in Finland. These observations have raised the question whether endocrine disrupting chemicals (EDCs) might be involved in these processes.

To address these concerns, the DISRUPT project, funded by the Research Council of Finland from 2020 to 2025, is actively investigating the presence of EDCs in waterbirds, with a specific focus on Eiders. Our research confirms the presence of a variety of EDCs in breeding female Eiders and their transfer to their eggs. These substances include Per- and polyfluoroalkyl substances (PFAS), lead, benzophenones, bisphenols, phthalates and parabens among others. The combined impact of these contaminants on the fitness and survival of female Eiders and ducklings remains largely unexplored.

We have uncovered a positive correlation between the sum of 5 PFAS, among which PFDoDS, and a precursor of sex hormones (androstenedione) in female eggs only, raising concern on PFAS endocrine disrupting effects on female embryos. We have also observed reduced hatchability in farmed Mallard (*Anas platyrhynchos*) eggs experimentally exposed to environmentally relevant concentrations of these PFAS, as well as a potential effect on hatchling sex ratio. Our findings underscore the need for further studies on contaminants in waterbirds and their population level impacts in combination with other large scale environmental stressors, combining in vitro and in vivo studies with demographic population-level modelling.

P4 - Tuesday, 9 January 2024, 11:45 CST
Poster

ASSOCIATING SEA DUCKS WITH COASTAL HABITATS IN BRITISH COLUMBIA

Bruce Harrison, Kathleen Moore, Llwellyn Armstrong, Jim Devries and Dan Buffett

BH, DB: Ducks Unlimited Canada, Kamloops, BC, Canada; b_harrison@ducks.ca
KM: Canadian Wildlife Service, Delta, BC, Canada
LA, JD: Institute of Wetland and Waterfowl Research, Ducks Unlimited Canada, Stonewall, MB, Canada

The coastal waters of British Columbia support significant populations of Pacific sea ducks, though habitat requirements of these species are poorly understood, making it difficult to prioritize conservation actions. We used mixed-effects models, utilizing 22 years of winter waterbird survey data from 268 sites along the BC coast and biophysical spatial data of this coastline to identify habitat attributes associated with the abundance of two prominent species of sea ducks: Bufflehead *(Bucephala albeola*) and Surf Scoter (*Melanitta perspicillata*). For Bufflehead, the best-approximating model accounted for about 60% of the variability in birds counted per site and included an effect of geographic region. The model predicts fewer Buffleheads present on the most northern- and western-located coastlines. Bufflehead abundance was positively influenced by the presence of eelgrass and kelp and was negatively associated with areas of rock and rock-sediment substrates, the number of inlets and with deeper water. For Surf Scoter, the best-approximating model accounted for about 40% of the variation in bird counts. This model predicted higher scoter abundance at intermediate latitudinal locations along the BC coast. Surf Scoter abundance was positively associated with the presence of shellfish, with sediment, soft, rock, and rock-sediment substrates, and with shorelines that are sinuous, highly exposed, and steeply sloped. The abundance of Surf Scoters was negatively influenced by the presence of barnacles, fucus species, and by deep water. Using these models, we created predictive spatial mapping products for bufflehead and surf scoter distribution long the BC coast. This conservation planning tool assists in identifying the best areas of coastal shoreline habitat to protect, restore and prioritize actions in after disasters such as oil spills.

P5 - Tuesday, 9 January 2024, 11:45 CST
Poster

BREEDING COMMON SCOTERS IN SCOTLAND'S EASTERN FLOW COUNTRY: 22-YEAR PRODUCTIVITY TRENDS AND CORRELATES

Robert Hughes

RH: Royal Society for the Protection of Birds and University of Highlands and Islands, United Kingdom; robert.hughes@rspb.org.uk

Capsule: The breeding productivity of the Flow Country Common Scoter *Melanitta nigra* population (half the UK breeding population) remained relatively stable during a 44% national population decline. The decline is likely to be driven by poor survival away from the breeding area.

Aim: To investigate breeding productivity changes in the eastern Flow Country Common Scoter population over 22 years and identify possible threats and causes of change during a period of national population decline.

Methods: Common Scoter from 32 breeding sites were surveyed annually between 2002 and 2023, each visited 2-3 times in May (pre-nesting period) and 2-3 times in July and August (post-hatch period) to record numbers of adults and juveniles**.**

Results: Between 2002 and 2023 across the study area, whilst the Common Scoter population declined (approximately 44% from 27 to 15 breeding pairs), breeding productivity (defined as large ducklings per female) remained stable averaging 0.44 (range 0 - 1.06) large ducklings fledged per female. The number of small ducklings per female also remained relatively stable. A year of higher breeding productivity did not result in an increase in the number of breeding females in the following years, suggesting that the cause of the decline lies away from the breeding region. Females preferred larger open lochs pre-nesting, whilst larger chicks favoured lochs with higher shoreline complexity.

Conclusion: The causes of the Common Scoter decline away from the breeding area need to be resolved to prevent local extinction. In the meantime, breeding productivity needs to be maintained and poor breeding seasons prevented. This may be assisted with the removal of non-native forestry in the area, which has been seen to benefit other ground nesting species from predation pressures.

P6 - Tuesday, 9 January 2024, 11:45 CST
Poster

ASSESSING COLOUR VARIATION OF THE COMMON EIDER, *SOMATERIA MOLLISSIMA*, IN THE FAROE ISLANDS AND ICELAND

Elisabeth Knudsen*, Snæbjörn Pálsson, Ellen Magnúsdóttir, James A. Fletcher, Árni Ásgeirsson, Jóhannis Danielsen, Sveinn Are Hanssen, and Jón Einar Jónsson

EK, SP: Institute of Life- and Environmental Sciences, University of Iceland, Sturlugata 7, 101 Reykjavík, Iceland; elk26@hi.is
EK, EM, JAF, AA, JEJ: University of Iceland, Snæfellsnes Research Center, Hafnargata 3, 340 Stykkisholmur, Iceland
JD: Faroe Marina Research Institute, Nóatún 1, 100 Tórshavn, Faroe Islands
SAH: Norwegian Institute for Nature Research (NINA), Sognsveien 68, 9855 Osla, Norway

The evolution of bird colouration has become a central matter in behavioural and evolutionary ecology and assessing the accurate colour is imperative. Female Common Eiders, *Somateria mollissima*, generally are greyish brown in colour with dark barring on the body but show individual variation from light grey to dark brown. The eiders in the Faroe Islands (*S. m. faeroeensis*) are usually described as dark while eiders from Iceland (*S. m. borealis*) are described as light/grey. We use a Konica Minolta Chromameter CR-400/410 to assess the colour in numerical data of female Common Eiders in Iceland and the Faroe Islands. The Chroma Meter measures Hue, Light and Chrome. We measured five body parts: Wing, back, chest, head, and face. This gives us a total of 15 values per bird measured. Of the 43 birds measured in the Faroe Islands, 57.5% were yellow/red (Y/R), while only 3.3% were Y/R of the 124 birds measured in Iceland. For comparison, we measured museum skins from four King Eiders, *Somateria spectabilis*, and interestingly they were 75% Y/R. We describe the colour variation within and among the two subspecies, both for individual traits and in combination per different individuals.

P7 - Tuesday, 9 January 2024, 11:45 CST
Poster

EXAMINING THE DYNAMICS OF CHOLERA IMMUNITY IN COMMON EIDERS IN THE CANADIAN ARCTIC USING WHOLE GENOME ANALYSIS

Shayla L. Kroeze*, Oliver P. Love, Mark R. Forbes, H. Grant Gilchrist, and Vicki L. Friesen

SLK: Queen's University, Kingston, ON; 15slk@queensu.ca
VLF: Queen's University, Kingston, ON, Canada
OPL: University of Windsor, Windsor, ON, Canada
MRF: Carleton University, Ottawa, ON, Canada
HGG: National Wildlife Research Centre, Environment Canada, Ottawa, ON, Canada

Conservation efforts are urgently needed for Arctic species which are now facing novel diseases. However, critical information on the genetics of disease resistance is lacking. The Common Eider (*Somateria mollissima*) is a colonial breeding sea duck that is an important source of fresh protein and feathers in northern communities and is an integral part of coastal and Indigenous culture. In 2006, avian cholera killed >30 % of hen eiders breeding at the largest colony in the eastern Arctic (Mitivik Island, Nunavut, Canada). We will use low coverage whole genome sequencing to test for a genetic basis for resistance to cholera in eiders. We hypothesize that genetic variants in some individuals conferred resistance to cholera, i.e., hens that died during the epidemic differed in identity of immunity-related genes (e.g., MHC Classes I and II genes, or toll-like receptor genes) compared to those that remained healthy. We also will test for genome-wide associations with cholera resistance controlling for related variables such as age, body condition, and arrival time. We will use an extensively archived time-series of DNA samples from the Mitivik Island eider colony to compare variation in identified genes before and after the cholera epidemic, as well as in populations that have and have not been exposed to cholera. Our work will provide valuable insight into the population genetics of disease resistance in wild populations, and the vulnerability of Arctic bird species to emerging infectious diseases.

P8 - Tuesday, 9 January 2024, 11:45 CST
Poster

ATLAS OF SEA DUCK KEY HABITAT SITES IN NORTH AMERICA

Tim D. Bowman, James L. Churchill, Christine Lepage, Shannon S. Badzinski, Scott G. Gilliland, Nic R. McLellan, and Emily D. Silverman (**Kate H. Martin**)

TDB, **KHM**: US Fish and Wildlife Service, Anchorage, AK, USA; kate_martin@fws.gov
JLC: Atlantic Canada Conservation Data Centre, Sackville, NB, Canada
CL: Environment and Climate Change Canada, Canadian Wildlife Service, Quebec, QC, Canada
SSB: Environment and Climate Change Canada, Canadian Wildlife Service, Ottawa, ON, Canada
SGG: Environment and Climate Change Canada, Canadian Wildlife Service, Sackville, NB, Canada (retired)
NRM: Ducks Unlimited Canada, Amherst, NS, Canada
EDS: U.S. Fish and Wildlife Service, Laurel, MD, USA

Available evidence suggests that several sea duck populations in North America are declining or below historical levels of abundance, and their habitats are susceptible to the impacts of climate change and other anthropogenic factors. The Sea Duck Joint Venture (SDJV) is a conservation partnership formed under the North American Waterfowl Management Plan to advance knowledge about sea ducks and improve their conservation and management.
Since 2001, SDJV partners have completed surveys and studies that provided information on the distribution and abundance of sea ducks throughout the annual cycle. Using this information and other available sources, the SDJV developed the Sea Duck Key Habitat Sites Atlas which describes 85 sites throughout North America that constitute important sea duck habitats. Criteria for site inclusion were chosen to highlight habitats most critical to sea ducks during at least one season. Sites had to meet the following minimum criteria: The area supports at least 5% of the continental population of a sea duck species, or the area supports a total of at least 20,000 sea ducks during any season, and the density of sea ducks within the area is at least 10 birds per kilometer. Narrative descriptions in the Atlas include a synopsis of sea duck abundance and importance of the site to sea ducks, as well as sensitivities or potential conflicts that may impact sea ducks or their habitats. The Atlas is intended to heighten awareness of valuable sea duck habitats, aid in prioritizing habitat conservation and protection efforts such as oil spill prevention and response and provide information for environmental assessments. The SDJV intends to regularly update the Atlas with new information as it becomes available. The Atlas and associated data products can be found at seaduckjv.org.

P9 - Tuesday, 9 January 2024, 11:45 CST
Poster

INGESTION OF PLASTIC AND NON PLASTIC DEBRIS IN SEA DUCKS IN BALTIC SEA

Julius Morkūnas and Rasa Morkūnė

JM: Marine Research Institute, Klaipeda University, Klaipeda, Lithuania;
juliusmorkunas@gmail.com
RM: Marine Research Institute, Klaipeda University, Klaipėda, Lithuanian

Marine debris pollution is a global environmental problem that has increased in the past decades. Plastic items and other debris in the water column might settle and become available to benthic or planktonic organisms or to those that feed on primary consumers, thus circulating in the food web. Diving seabirds, which spend a considerable part of their annual cycle on wintering grounds in the Baltic Sea, can ingest different types of debris from various food web compartments, either directly or indirectly, into their organisms. This study presents the first data related to debris ingestion by diving seabirds wintering in the south-eastern Baltic Sea. It sets baselines for further studies and provides the initial global record of plastic ingestion in the Long-tailed Duck (*Clangula hyemalis*). Out of the six studied seabird species, 2.1% of the total 524 examined individuals collected from fishery bycatch had ingested marine debris. The frequency of ingestion for the Long-tailed Duck, Common Murre (*Uria aalge*), and Red-throated Loon (*Gavia stellata*) and Velvet Scoter with a dominance of plastic objects. Additionally, the first record of ingestion leading to severe body condition damage was found in the Velvet Scoter. By providing detailed information about the studied individuals and the debris, this study initiates a discussion about diving birds' sensitivity to marine debris, which may depend on the birds' feeding preferences expressed as isotopic niches.

P10 - Tuesday, 9 January 2024, 11:45 CST
Poster

LONG-TAILED DUCK (CLANGULA HYEMALIS) WITH YOUR IN TUYA MOUNTAINS PROVINCIAL PARK: A FIFTH BREEDING RECORD FOR BRITISH COLUMBIA

Aiva C.M. Noringseth* and Jack Bindernagel

AN, JB: School of Environmental Studies, University of Victoria, Victoria, BC, Canada; aivanoringseth@gmail.com

On July 24, 2023 we observed and documented a female Long tailed Duck (*Clangula hyemalis*) with six precocial juvenile young on an alpine pond in northwestern British Columbia, approximately 85 km north of Dease Lake. In addition to a second sighting of a female with one flightless young, these observations constitute only a fifth breeding record for this species within the province. We describe the details of these observations, provide photographs, and offer brief discussion of their relevance of this species life history attributes within British Columbia.

P11 - Tuesday, 9 January 2024, 11:45 CST
Poster

POINT LEPREAU BIRD OBSERVATORY - MONITORING SEADUCK SPRING MIGRATION IN THE BAY OF FUNDY

Anthony W. Diamond, James D. Kelley, Heather L. Major, Todd Watts, James G. Wilson, and **Eileen Pike**

AD, HM, JK, **EP**: University of New Brunswick, NB, Canada; pike@unb.ca
TW, JW: Saint John Naturalists' Club, Inc., NB, Canada

Strategically situated on the North American Atlantic Flyway at N 45’ 03” 490’, W 66’ 27” 525’ near the mouth of the Bay, the observatory is at the tip of Point Lepreau which juts out 3 km as the most prominent point of land on the New Brunswick coast of the Bay. The mouth of the Bay of Fundy acts as a gigantic funnel for birds following the North Atlantic coastline during northward migration. Most seabirds wintering south of the Bay of Fundy probably pass within a short distance of Point Lepreau in spring on their way to northern nesting areas. Sea duck and and Loon migration has been monitored at the Point Lepreau Bird Observatory (PLBO) every spring since 1996 by the Saint John Naturalists’ Club, Inc. Tens of thousands of the focal species (Black, White-winged, and Surf Scoters, Common and Red-throated Loons) are counted every spring. Other species monitored include Common Eider, Harlequin Duck, Long-tailed Duck, and Double-crested Cormorant. Standard 15-minute counts record species, numbers, direction of travel, wind speed and direction, and state of tide. Observations between 15 March and 9 May show greater numbers of scoters, but fewer loons, passing by with a tail wind; scoter numbers reach a peak before the end of the observation period, when loon numbers are still increasing. The most recent analyses suggest no change in numbers over 18 years of data collection, demonstrating the importance of long-term coastal monitoring at this site. Annual data are shared with Environment and Climate Change Canada’s Canadian Wildlife Service which has partnered with the project since its inception. Other partners include Fisheries and Oceans Canada, NB Power, Ducks Unlimited Canada, Birds Canada and NB Wildlife Trust Fund.

P12 - Tuesday, 9 January 2024, 11:45 CST
Poster

PROTECTIVE NESTING ASSOCIATIONS OF THE PACIFIC COMMON EIDER IN THE ASIAN PART OF THE RANGE: RANDOM COINCIDENCE OF NESTING SITES OR DELIBERATE CHOICE?

Olga Prokopenko*, Daria Barykina, and Diana Solovyeva

OP, DB, DS: Institute of Biological Problems of the North FEB RAS, Portovaya 18, Magadan, Russia; olga_prokopenko95@mail.ru

The Pacific Common Eider, *Somateria mollissima v-nigrum*, population is listed as a U.S. Fish and Wildlife Service Bird of Management Concern and an Audubon WatchList species and declined throughout their range. The species is now under consideration for the red data Book of Chukotka. We implemented a multi-year monitoring project in the key breeding area of the Pacific Eider along the Arctic coast of Asia. In 2018-2022 we conducted research on the coast of the East Siberian Sea, Chukotka, Russia (Apapelgin River Delta). Together with eiders we reported nesting habitats and nest sites, phenology and density for all large bird nesting in the study area. A database of 479 patron species nests and 883 eider nests was used. Patron species included large gulls *Larus hyperboreus* and *L. vegae*, Arctic tern, Rough-legged Buzzard and Peregrine Falcone. Egg laying date was determined by the back-dating of floated eggs of eiders and protective species. We used high resolution GPSs to determine the location of nests. A layer was created that included shapefiles of all nests found over the entire period of research in the Quantum GIS program. Statistical data processing was carried out in the “R” statistical modeling environment, using standard statistical analysis packages. We tested a hypothesis either eiders select nest sites randomly and coincidence with patrons is a result of habitat similarity, or there is a deliberate choice. Eider egg laying date (before or after patron) was used as a proxy to distinguish random coincidence of nesting sites vs deliberate choice.

P13 - Tuesday, 9 January 2024, 11:45 CST
Poster

B-FINDER -AUTOMATIC BIRD COLLISION MONITORING SYSTEM FOR WIND POWER AS TOOL FOR DUCK CONSERVATION AND MANAGEMENT

Michael Przybycin

MP: B-finder Team EMPEKO S.A.; info@b-finder.eu

This presentation shows results of 30-months long test of the prototype of B-finder system. B-finder system is breakthrough automation technology for wildlife post-construction monitoring based on sensors. B-finder technology enables automatic bats & birds fatality monitoring for onshore & offshore project. Post-construction fatality of bat and bird on wind turbines onshore monitoring methods are based on searching on the ground. Such methods are not suitable for offshore wind farms. In this presentation breakthrough solution for automated counting and mapping of bat and bird collision in real time is described. B-finder system introduces automation, efficiency and transparency of bird including duck collision monitoring on wind farms. Extra features enable sea duck activity monitoring in wind turbine surrounding. Results of tests shows the readiness of B-finder system to be a new measurement standard for onshore and offshore wind power and open way to duck fatality management in incidental taken permits system.

P14 - Tuesday, 9 January 2024, 11:45 CST
Poster

LIVING PILING: A NOVEL APPROACH TO SUBTIDAL HABITAT RESTORATION FOR SEA DUCKS

Samantha E. Richman and Susan E. W. De La Cruz

SER, SEWD: Western Ecological Research Center, US Geological Survey, Moffett Field, CA USA; srichman@usgs.gov

We are evaluating a novel approach to subtidal habitat restoration by repurposing creosote-treated timber pilings (CTPs) using a commercially available piling repair system. While removal of derelict CTP is preferred, there are some areas where removal is not feasible or practical. Where CTPs are ineligible for removal, encapsulating CTP may reduce or eliminate chemical leaching from creosote (polycyclic aromatic hydrocarbons, PAH) known to affect the growth and survival of marine organisms, provide a non-toxic surface for vital fish and invertebrate communities, and enhance prey resources for waterfowl. In November 2020, we installed two types of piling repair jackets on 24 CTP made of fiberglass (n = 12, Denso SeaShield™) and PVC rated for potable water (n = 12, SnapJacket™), and each piling was capped with a hardwood roosting platform. To encourage rapid recruitment of invertebrates, we tested two surface treatments of aluminum or fiberglass mesh. For each CPT encapsulation treatment and unencapsulated controls, samples across tidal zones (subtidal, intertidal) were collected quarterly to compare algae and invertebrate colonization rates, and PAH concentrations in invertebrates. Within 6 months of deployment, both types of jackets had 60-80% live cover consisting of algae and early succession invertebrate species, and by 12 months they were 100% covered. We observed high densities of barnacles, mussels, and oysters within 9 months of deployment. We are currently evaluating biodiversity and composition of native and exotic species, biomass, and/or density. Future applications include using a conservation aquaculture approach, wrapping encapsulated pilings with hatchery-reared native blue mussels (*Mytilus californianus*) to accelerate the creation of subtidal reefs. This work is informing the use of existing infrastructure and commercially available materials to provide a cost-effective and low maintenance restoration alternative, broadly applicable to urban estuaries and remediation of derelict pilings to advance subtidal habitat goals.

P15 - Tuesday, 9 January 2024, 11:45 CST
Poster

RESTORATION OPPORTUNITIES FOR SEA DUCK POPULATIONS INJURED BY COASTAL OIL SPILLS

Samantha E. Richman, Susan E.W. De La Cruz, Carolyn Marn, Dan Esler, Abby Powell, Stuart Slattery, and Ramūnas Žydelis

SER, SDLC: Western Ecological Research Station, US Geological Survey, Moffett Field, CA, USA; srichman@usgs.gov
CM: US Fish and Wildlife Service, Sacramento, CA, USA
DE: Alaska Science Center, US Geological Survey, Anchorage, AK, USA
AP: Florida Cooperative Wildlife Research Center, US Geological Survey, Gainesville, FL, USA
SS: Ducks Unlimited Canada, Stonewall, MB, Canada
RŽ: Lithuanian Ornithology Society, Vilnius, Lithuania; Ornitela, Vilnius, Lithuania

Sea ducks are densely distributed along the North American coast where they are extremely vulnerable to oil spills, often making up a large component of bird injuries. Finding effective restoration actions for sea duck populations has been challenging due to their unique life-history strategies and sensitivity to adult annual survival. As long-lived birds with delayed maturity, and generally low reproductive rates, sea ducks are often slow to recover following spills and their populations can be impacted by a single spill for decades or longer. For colonial and cavity-nesting species, nest box programs on the breeding grounds are a successful restoration tool, but for other species that breed at extremely low densities across the Arctic and boreal habitats, on-the-ground restoration is limited. Thus, focusing efforts on other areas, at other times of the year may be a more practical restoration alternative. In areas where sea ducks congregate or multiple species overlap during the annual cycle, populations would benefit from both direct restoration through habitat creation or prey enhancement as well as indirect protection of key sites through spill prevention, safer transport regulation, and emergency preparedness, including staging supply caches and heavy equipment at remote outposts needed for sea ice conditions. For sea duck populations injured by coastal oil spills, a better understanding of their varied and unique traits, basic vital rates, and identifying important concentration areas and habitat needs will help restoration practitioners implement and prioritize where and when restoration actions may have the greatest long-term impact for these unique and difficult to restore taxa.

P16 - Tuesday, 9 January 2024, 11:45 CST
Poster

LONG-TERM DATA REVEAL CONTRASTING IMPACTS OF NATIVE VERSUS INVASIVE NEST PREDATORS IN ICELAND

Jón Einar Jónsson, **Fiona S. Rickowski***, Florian Ruland, Árni Ásgeirssonand Jonathan M. Jeschke

JEJ, ÁÁ: University of Iceland's Research Center at Snæfellsnes, Stykkishólmur Iceland
FSR, FR, JMJ : Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), Berlin, Germany & Department of Biology, Chemistry, Pharmacy, Institute of Biology, *Freie* Universität *Berlin*, Berlin, Germany; Fionarickowski@web.de

Bird species on islands are strongly impacted by biological invasions, with the Icelandic Common Eider (*Somateria mollissima borealis*) being particularly threatened. Down collection by local families in Breiðafjörður, West Iceland, provided long-term datasets of nests from two archipelagos, covering 95 islands over 123 years and 39 islands over 27 years, respectively. Using these exceptional datasets, we found that the arrival of the invasive semi-aquatic American mink (Neogale vison) was a more impactful driver of population dynamics than climate. This invasive predator heavily reduced eider nest numbers by ca. 60% in the Brokey archipelago. In contrast, we detected an apparently adaptive response to the return of the native fox in the Purkey archipelago, with dense nests on islands inaccessible to the fox and no apparent impact on eider populations. This difference might be due to the eiders lacking a joint evolutionary history with the mink and therefore lacking appropriate antipredator responses.

P17 - Tuesday, 9 January 2024, 11:45 CST
Poster

TOURISM AT AN EIDER COLONY: A MUTUALLY BENEFICIAL RELATIONSHIP

Nora M. Wilson*, Peppi Wilson, and Henrik Wilson

NMW, PW, HW: Oy Bengtskär Ab
NMW: Faculty of Science and Engineering, Åbo Akademi University, Finland,
nora.wilson@outlook.com

Bengtskär is a small island (ca 150 m × 200 m) in the Gulf of Finland with a large population of nesting Common Eiders (*Somateria mollissima*). The population has increased every year since the lighthouse opened for tourists in the 1990s, from around 5 to over 500 nests. We believe this to be thanks to human activity keeping predators, mainly the White-tailed Eagle (*Haliaeetus albicilla*), at bay. On other islands in the area the eider population has decreased drastically. Over the years the Bengtskär eiders have adapted and become less afraid of humans. The eiders nest next to buildings, even within a meter of the main entrance. All tourists arriving on the island are informed on how to behave respectfully around the eiders and precautions are taken to ensure they do not get too close to the nests. Each year we do landscaping to increase the nesting area to account for the growing population. During the lasts years trips to Bengtskär in May have been marketed as “Eider safaris”, attracting more tourists to the island during breeding season. Humans being present continuously from the start of egg-laying ensures a safe environment for the nesting females.

P18 - Tuesday, 9 January 2024, 11:45 CST
Poster

LONG-TAILED DUCK (CLANGULA HYEMALIS) AS UNDERWATER SPECIES

Ramūnas Žydelis, Julius Morkūnas, and Rasa Morkūnė

RŽ: Lithuanian Ornithology Society, Vilnius, Lithuania; Ornitela, Vilnius, Lithuania
zydelis@ornitela.eu
JM: Lithuanian Ornithology Society, Vilnius, Lithuania; Marine Research Institute, Klaipėda University, Klaipėda, Lithuania
RM: Marine Research Institute, Klaipėda University, Klaipėda, Lithuania

Long-tailed duck is a small bodied species wintering in a cold water environment and eating cold food consisting mostly of shell. This not very nutritious food is often collected from great depths, where it is either strongly attached to hard substrate or buried in soft sediment. Energetically, such a life strategy makes little sense from a human perspective. Thus, we are fascinated by remarkable adaptations of this species and wonder how it manages to meet bioenergetic ends during the winter? How busy are Long-tailed ducks feeding? Do they have flexibility to adapt to changing environmental conditions and human disturbances?
To start answering these questions we tracked 10 Long-tailed ducks fitted with GPS-GSM transmitters additionally equipped with depth sensors enabling us to record each dive at 1 second resolution. The study was conducted in the eastern Baltic.

Tracked birds were rather mobile and utilized coastal waters of the entire eastern Baltic. Most frequently Long-tailed ducks were diving at depths between 10-20 meters with some individuals foraging at 30 or even as deep as 40 meters. On a typical day, Long-tailed duck makes 200-500 dives to the bottom. And on some days these birds spend more time underwater than on the surface during the daylight hours.

CONTACTS

Last	First	Position	Affiliation	Country	Email
Al-Saffar	Mohammed	Wildlife Biologist	US Fish and Wildlife Service	United States	mohammed_al-saffar@fws.gov
Anderson	Tracy	Graduate Student - Response Specialist	University of Guelph/Focus Wildlife	Canada	tracy@focuswildlife.org
Annanie	Andrew	Graduate Student	Western Washington University	United States	annania@wwu.edu
Arzel	Céline	Academy Research Fellow	University of Turku	Finland	celine.arzel@utu.fi
Avery-Gomm	Stephanie	Adjunct Professor	Memorial University of Newfoundland	Canada	Stephanie.averygomm@gmail.com
Baak	Julia	Conservation Biologist	Canadian Wildlife Service	Canada	julia.baak@ec.gc.ca
Badzinski	Shannon	Waterfowl Biologist	Canadian Wildlife Service - Ontario	Canada	shannon.badzinski@ec.gc.ca
Bas	Kyla	Biologist	Ducks Unlimited Canada	Canada	k_bas@ducks.ca
Bellow	Antti		Nature Conservation	Finland	antti.below@metsa.fi
Berlin	Alicia	Science Team Manager	USGS Eastern Ecological Science Center	United States	aberlin@usgs.gov
Bianchini	Kristin	Wildlife Habitat Biologist	Environment and Climate Change Canada	Canada	kristin.bianchini@ec.gc.ca
Blenk	Rob	PhD Candidate	University of California, Davis	United States	rb366@humboldt.edu

Last	First	Position	Affiliation	Country	Email
Botkin	Clayton	One Health Master's Graduate Student	University of Alaska Fairbanks	Canada	claytonbotkin@hotmail.com
Bowman	Tim	Retired, SDJV Coordinator	US Fish and Wildlife Service	United States	bowmantim38@gmail.com
Boyd	W. Sean	Retired	Environment and Climate Change Canada	Canada	sean.boyd@ec.gc.ca
Bradley	David	BC Director	Birds Canada	Canada	dbradley@birdscanada.org
Bragina	Evgenia	Coordinator of Scientific Capacity Development	Wildlife Conservation Society	United States	ebragina@wcs.org
Brown	Kayla	Wildlife Stewardship Technician	Nunatukavut	Canada	stewardshiptech@nunatukavut.ca
Burt	Emily	Graduate Student	McGill University	Canada	emily.burt2@mail.mcgill.ca
Campbell	Margaret	Waterfowl Biologist - SDJV Canadian Coordinator	Canadian Wildlife Service	Canada	margaret.campbell@ec.gc.ca
Champgne	Patrick	Spatial Analyst	Atlantic Coastal Island Project, Acadia University	Canada	patrickchampgne@gmail.com
Craik	Shawn	Associate Professor	Université Sainte-Anne	Canada	shawn.craik@usainteanne.ca
Crysler	Zoe	Marine Spatial Planner / Emergency Preparedness Coordinator	Environment and Climate Change Canada - Canadian Wildlife Service	Canada	zoe.crysler@ec.gc.ca
De La Cruz	Susan	Research Wildlife Biologist	US Geological Survey	United States	sdelacruz@usgs.gov
De Zeeuw	Maureen	Wildlife Biologist	Bureau of Ocean Energy Management	United States	maureen.dezeeuw@boem.gov
Derksen	Dirk	retired	none	United States	mrpetersen51@gmail.com

Last	First	Position	Affiliation	Country	Email
Douglas	David	Research Wildlife Biologist	US Geological Survey	United States	ddouglas@usgs.gov
Duclos	Isabelle	Biologist, Marine Specialist	Environment and Climate Change Canada - Canadian Wildlife Service	Canada	Isabelle.Duclos@ec.gc.ca
Dudley	Steve	retired	British Ornithological Union	United Kingdom	stevedudley787@gmail.com
Dupuis-Smith	Reyd	PhD Candidate	Carleton University	Canada	reydsmith@cmail.carleton.ca
Edgar	Santana	Marine Planning Coordinator	Kitasoo Xai'xais Stewardship Authority	Canada	marineplanning@kxsa.ca
Evenson	Joseph	Biologist	Washington Department of Fish and Wildlife	United States	joseph.evenson@dfw.wa.gov
Esler	Daniel	Research Wildlife Biologist	US Geological Survey	United States	desler@usgs.gov
Fara	Luke	Biologist	US Geological Survey	United States	lfara@usgs.gov
Fellows	Suzanne	Program Manager	US Fish and Wildlife Service	United States	suzanne_fellows@fws.gov
Forni	Paola	PhD student	Klaipeda University	Lithuania	paola.forni@ku.lt
Forsell	Doug	Retired	US Fish and Wildlife Service	United States	djforsell@aol.com
Foth	Justyn	National Joint Venture Coordinator	US Fish and Wildlife Service	United States	justyn_foth@fws.gov
Fredrickson	Leigh	Senior Ecologist	Wetland Management and Educational	United States	giantcoot@gmail.com
Friendly	Randall	Student Trainee (Pathways)	US Fish and Wildlife Service	United States	rjfriendly2@alaska.edu

Last	First	Position	Affiliation	Country	Email
Graff	Nathan	Wildlife Biologist	US Fish and Wildlife Service	United States	Nathan_graff@fws.gov
Gilchrist	Grant	Research Scientist	Environment and Climate Change Canada	Canada	grant.gilchrist@ec.gc.ca
Gilliland	Scott	Retired	Canadian Wildlife Service	Canada	Sgg64@me.com
Giroux	Jean-François	Professor	Université du Québec à Montréal	Canada	Giroux.jean-francois@uqam.ca
Gloutney	Mark	National Director of Science, Education and Business Planning	Ducks Unlimited Canada	Canada	m_gloutney@ducks.ca
Gordon	David	Chief	US Fish and Wildlife Service	United States	david_gordon@fws.gov
Gray	Shane	Wildlife Biologist	Bureau of Ocean Energy Management	United States	Shane.gray@boem.gov
Green	Ros	PhD Student	University of Liverpool	United Kingdom	r.m.w.green@liverpool.ac.uk
Grewal	Asha	Student	Acadia University, Department of Biology	Canada	ashagrewal@acadiau.ca
Gutowsky	Sarah	Research Associate	Acadia University, DUC, ECCC	Canada	sarahegutowsky@gmail.com
Hall	Sierra	Research Field Technician	Kitasoo Xai'xais Stewardship Authority	Canada	Sierra.hall22@gmail.com
Hamer	Matthew	Waterfowl Biologist	Washington Department of Fish and Wildlife	United States	Matthew.hamer@dfw.wa.gov
Hargan	Kathryn	Assistant Professor	Memorial University	Canada	khargan@mun.ca

Last	First	Position	Affiliation	Country	Email
Harrison	Bruce	Head of Conservation Science/Planning	Ducks Unlimited Canada	Canada	b_harrison@ducks.ca
Heath	Joel	Executive Director	Arctic Eider Society	Canada	heath.joel@gmail.com
Hewitt	Jacob	Graduate Research Assistant	State University of New York - Brockport	United States	jhewi4@brockport.edu
Holmes	Holli	Masters student	University of Montana	United States	holli.holmes@umconnect.umt.edu
Hruby	Mike	Volunteer - Major Donor	Ducks Unlimited Inc	United States	mikehruby65@gmail.com
Huff	Mary		Interested Citizen	United States	mehuff10@outlook.com
Hughes	Rob	PhD Student	University of Highlands and Islands	United Kingdom	robert.hughes@rspb.org.uk
Insley	Stephen	Conservation Scientist	Wildlife Conservation Society Canada	Canada	sinsley@wcs.org
Jaczko	Emma		Sea Duck Enthusiast	United States	emmajaczko@gmail.com
Jamison	Brent	Wildlife Biologist	US Fish and Wildlife Service	United States	brent_jamison@fws.gov
Johnston	Scott	Wildlife Biologist	US Fish and Wildlife Service	United States	Scott_johnston@fws.gov
Jónsson	Jón Einar	Research Scientist	University of Iceland's Research Center at Snæfellsnes	Iceland	joneinar@hi.is
Kapsar	Kelly	Postdoctoral Research Associate	Michigan State University	United States	kelly.kapsar@gmail.com
Kemp	Jesse	PhD Candidate	Simon Fraser University	Canada	jessek@sfu.ca

Last	First	Position	Affiliation	Country	Email
Kilburn	Jennifer	Principal Biologist - Waterfowl Program	Rhode Island Department of Environmental Management	United States	Jennifer.Kilburn@dem.ri.gov
Klein	Kimberly	Wildlife Biologist	Bureau of Ocean Energy Management	United States	kimberly.klein@boem.gov
Knudsen	Elisabeth	PhD student	University of Iceland's Research Centre in Snæfellsnes	Iceland	elk26@hi.is
Koneff	Mark	Chief, Migratory Bird Surveys	US Fish and Wildlife Service - Division of Migratory Bird Management	United States	mark_koneff@fws.gov
Kraemer	Jacob	Aviary Director	Pinola Conservancy/Association of Zoos and Aquariums	United States	jkraemer@pinola.net
Kroeze	Shayla	PhD Student	Queen's University	Canada	15slk@queensu.ca
Lamb	Juliet	Marine Scientist	The Nature Conservancy	United States	juliet.lamb@tnc.org
Landolt	Kyle	Geographer	US Geological Survey	United States	klandolt@usgs.gov
Larsson	Kjell	Professor Emeritus	Linnaeus University	Sweden	kjell.larsson@lnu.se
Lenske	Ariel	Technician	Environment and Climate Change Canada	Canada	ariel.lenske@ec.gc.ca
Leowinata	Deirdre	Communications	Kitasoo Xai'xais Stewardship Authority	Canada	communications@kxsa.ca
Lepage	Christine	Waterfowl Biologist	Canadian Wildlife Service	Canada	christine.lepage@ec.gc.ca
Loring	Pam	Wildlife Biologist	US Fish and Wildlife Service	United States	pamela_loring@fws.gov
Lovvorn	Jim	Professor	Southern Illinois University	United States	lovvorn@siu.edu

Last	First	Position	Affiliation	Country	Email
Loya	Wendy	SIMBA ARD	US Fish and Wildlife Service	United States	wendy_loya@fws.gov
MacCallum	Beth	Biologist	Bighorn Wildlife Technologies Ltd.	Canada	ovis@bighornwildlife.com
MacDonald	Emily	Master of Science Student	University of Windsor	Canada	macdon85@uwindsor.ca
Maliguine	Anastasia	Graduate Student	University of Alaska Fairbanks	United States	ammaliguine@alaska.edu
Mann	Fran	Chief, NEPA Section 1	Bureau of Ocean Energy Management	United States	frances.mann@boem.gov
Markones	Nele	Senior Researcher	Federation of German Avifaunists DDA	Germany	nele.markones@dda-web.de
Marn	Carolyn	Biologist	US Fish and Wildlife Service	United States	carolyn_marn@fws.gov
Martin	Kate	US Coordinator	Sea Duck Join Venture	United States	Kate_martin@fws.gov
Matsyna	Alexander	Researcher	Ecological Center 'Dront'	Russia	matsynalex@gmail.com
McAdie	Malcolm	Wildlife Veterinarian	McAdie Wildlife Veterinary Services	Canada	malcolmmcadie@shaw.ca
McCarron	Alison	Biologist	University of Alaska Fairbanks	United States	alifmccarron@alaska.edu
McCarthy	Erin	Biologist	US Fish and Wildlife Service	United States	emccarthy2@alaska.edu
McLellan	Nic	Research Biologist	Ducks Unlimited Canada	Canada	n_mclellan@ducks.ca
McWilliams	Scott	Professor	University of Rhode Island	United States	srmcwilliams@uri.edu
Meattey	Dustin	Waterfowl Program Director	Biodiversity Research Institute	United States	dustin.meattey@briwildlife.org
Meyer	Shawn	Waterfowl Biologist	Canadian Wildlife Service Ontario Region	Canada	shawn.meyer@ec.gc.ca

Last	First	Position	Affiliation	Country	Email
Mezebish	Tori	PhD Candidate	University of Rhode Island	United States	tmezebish@uri.edu
Miller	Micah	Waterbird Scientist	Biodiversity Research Institute	United States	micah.miller@briwildlife.org
Millett	Lee	Furbearer and Small Game Biologist	Nova Scotia Department of Natural Resources and Renewables	Canada	lee.millett@novascotia.ca
Monette	DJ	National Native American Liaison Advisor	US Fish and Wildlife Service	United States	dj_monette@fws.gov
Moore Reid	Wallis	Senior Wildlife Rehabilitator	BC SPCA	Canada	wmoorereid@spca.bc.ca
Morkūnas	Julius	Researcher	Lithuanian Ornithological Society, Klaipeda University	Lithuania	juliusmorkunas@gmail.com
Mosbech	Anders	Senior scientist	Aarhus University, Department of Ecoscience	Denmark	amo@ecos.au.dk
Murphy	Kevin	Interested citizen	Interested citizen	United States	kfmurph@comcast.net
Myers	Natalie	Communications & Marketing Coordinator	Pacific Birds	United States	natalie_myers@pacificbirds.org
Nehls	George	Managing Director	BioConsult SH GmbH	Denmark	g.nehls@bioconsult-sh.de
Nicol-Harper	Alex	PhD Candidate	University of Southampton	United Kingdom	alex.nicol-harper@wwt.org.uk
Nitah	Chief Steven	Managing Director	Nature4Justince Canada, former Chief of the Akaitcho Peoples, NWT	Canada	
Noringseth	Aiva	Assistant	School of Environmental Studies University of Victoria; B.C. Important Bird Areas Program	Canada	aivanoringseth@gmail.com
Olsen	Glenn	Veterinary Medical Officer	US Geological Survey	United States	golsen@usgs.gov

Last	First	Position	Affiliation	Country	Email
Osborne	Douglas	Professor	University of Arkansas System Division of Agriculture	United States	osborne@uamont.edu
Osenkowski	Jay	Deputy Chief for Wildlife	Rhode Island Department of Environmental Management	United States	jay.osenkowski@dem.ri.gov
O'Shea	William	Wildlife Habitat Biologist	Environment and Climate Change Canada - Canadian Wildlife Service	Canada	william.oshea@ec.gc.ca
Osterberg	Johanna	Research assistant	BioConsult SH GmbH	Germany	j.osterberg@bioconsult-sh.de
Pearce Meijerink	Sara	Wildlife Biologist	NunatuKavut Community Council	Canada	wildlifebiologist@nunatukavut.ca
Pelo	Kristen	Avian Curator	Alaska SeaLife Center	United States	kristenp@alaskasealife.org
Pereksta	David	Marine Biologist	Bureau of Ocean Energy Management	United States	David.pereksta@boem.gov
Petersen	Ævar	Retired	Independent Researcher	Iceland	aevar@nett.is
Petersen	Margaret	retired		United States	dirkderksen@aol.com
Phelps	Adam	Waterfowl Research Biologist	Indiana Department of Natural Resources	United States	aphelps@dnr.in.gov
Pickens	Bradley	Remote Sensing and Geospatial Specialist	US Fish and Wildlife Service	United States	bradley_pickens@fws.gov
Pike	Eileen	Member Emeritus	Point Lepreau Bird Observatory Committee	Canada	pike@unb.ca
Plesh	Steven	Former Graduate Student	Southern Illinois University-Carbondale	United States	steven.plesh@siu.edu
Porter	Riley	Graduate Research Assistant	Mississippi State University	United States	rdp275@msstate.edu

Last	First	Position	Affiliation	Country	Email
Prelinger	Megan	adult education instructor	Golden Gate Bird Alliance	United States	meganprelinger@gmail.com
Prokopenko	Olga	Student	Institute of Biological Problems of the North FEB RAS	Russia	olga_prokopenko95@mail.ru
Ragan	Liam	Provincial Coordinator - Important Bird and Biodiversity Areas	BC Nature	Canada	liamragan@redpollconsulting.ca
Reed	Eric	Population Management Biologist	Canadian Wildlife Service	Canada	eric.reed@ec.gc.ca
Reid	Fritz	Retired, Arctic and Boreal Conservation	Ducks Unlimited Inc	United States	freid@ducks.org
Reyna	Kelly	Director of the Lyon Center for Gamebird Research	Texas A&M University - Commerce	United States	Kelly.Reyna@tamuc.edu
Rhodes	Walt	Wildlife Biologist	US Fish and Wildlife Service	United States	Walt_Rhodes@fws.gov
Richman	Samantha	Ecologist, Conference Coordinator	US Geological Survey	United States	srichman@usgs.gov
Rickowski	Fiona	Doctoral student	Leibniz Institute of Freshwater Ecology and Inland Fisheries & Institute of Biology, Freie Universität	Germany	fionarickowski@web.de
Rizzolo	Daniel	Biologist	US Fish and Wildlife Service	United States	daniel_rizzolo@fws.gov
Roberts	Patrick	Renewable Energy Biologist	US Fish and Wildlife Service	United States	patrick_roberts@fws.gov
Roberts	Tony	Wildlife Biologist	US Fish and Wildlife Service	United States	anthony_roberts@fws.gov
Rogers	Bob	Marine Gamebird Biologist	Canadian Wildlife Service	Canada	Robert.Rogers@ec.gc.ca

Last	First	Position	Affiliation	Country	Email
Ross	Megan	Migratory Game Bird Biologist	Environment and Climate Change Canada	Canada	megan.ross@ec.gc.ca
Safine	David	Wildlife Biologist	US Fish and Wildlife Service	United States	david_safine@fws.gov
Savard	Jean-Pierre	Retired	Canadian Wildlife Service	Canada	Jean-pierre.savard@videotron.ca
Schlieps	Jenny	Program Manager	Focus Wildlife	United States	jenny@focuswildlife.org
Schouten	Arnold	Owner/ Operator	Dry Creek Waterfowl	United States	arndeb@olypen.com
Selawik			Indigenous Community	Canada	selawik@fws.gov
Seyer	Yannick	Wildlife biologist	Canadian Wildlife Service	Canada	yannick.seyer@ec.gc.ca
Shively	Kayla	Conservation Ecologist	Wildlife Conservation Society, Arctic Beringia Program	United States	kshively@wcs.org
Shoji	Akiko	Associate Professor	University of Tsukuba	Japan	shoji.akiko.gw@u.tsukuba.ac.jp
Silverman	Emily	Biometrician	US Fish and Wildlife Service	United States	Emily_silverman@fws.gov
Simmons	Emily	Gamekeeper	Dry Creek Waterfowl Sanctuary	United States	simmone2@oregonstate.edu
Solovyeva	Diana	Researcher	Institute of Biological Problems of the North FEB RAS	Russia	diana.solovyova@mail.ru
Sørensen	Iben Hove	Biologist	Aarhus University	Denmark	ihs@ecos.au.dk
Spragens	Kyle	Waterfowl Section Manager	Washington Department of Fish and Wildlife	United States	kyle.spragens@dfw.wa.gov

Last	First	Position	Affiliation	Country	Email
Stipniece	Antra	Researcher	University of Lativia	Latvia	antra.stipniece@lu.lv
Sweeny	Brittany	Outreach Specialist	US Fish and Wildlife Service	United States	Brittany_sweeny@fws.gov
Trudeau	Olivia	Graduate Student	British Columbia Institute of Technology & Simon Fraser University	Canada	o_trudeau@hotmail.com
Veazey	Lindsay	Postdoctoral Research Associate	Sikuliaq/Seward Marine Center	United States	lmveazey@alaska.edu
Waltho	Chris		Independent Researcher	United Kingdom	Chris.waltho@eider.org.uk
Ware	Lena	Biologist	Canadian Wildlife Service - Northern Region	Canada	lena.ware@ec.gc.ca
Watford	Elyssa	Graduate Student	Institute of Arctic Biology - University of Alaska Fairbanks	United States	elyssa.watford@gmail.com
Watts	Todd	Official Counter/Observer	Point Lepreau Bird Observatory (operated by the Saint John Naturalists' Club)	Canada	buteobuz@gmail.com
Wetherhill	Anthony	Research Officer	British Trust for Ornithology Scotland	United Kingdom	anthony.wetherhill@bto.org
Williams	Kate	Director of the Center for Research on Offshore Wind and the Environment	Biodiversity Research Institute	United States	kate.williams@briwildlife.org
Wilson	Nora	PhD Student	Åbo Akademi University	Finland	nwilson@abo.fi
Wilson	Peppi	Guide	Oy Bengtskär Ab	Finland	peppi.wilson@outlook.com

Last	First	Position	Affiliation	Country	Email
Wood	Mesha	Park Ranger, Junior Duck Stamp Coordinator	US Fish and Wildlife Service	United States	mesha_wood@fws.gov
Younkins	Lillie	Biologist	US Fish and Wildlife Service	United States	lillie_younkins@fws.gov
Žydelis	Ramūnas		Ornitela		zydelis@ornitela.eu


7th International Sea Duck Conference
8 - 11 Jan 2024