Sea Duck Joint Venture
Annual Project Summary
FY24 (October 1, 2023 – September 30, 2024)

Project Title *(including SDJV Project #)*: SDJV 176: An integrated model of scoter populations in eastern North America with a focus on estimating survival

Principal Investigators *(name, affiliation, email address)*:
Frances E. Buderman, Pennsylvania State University, fbuderman@psu.edu
Anthony Roberts, US Fish and Wildlife Service, anthony_roberts@fws.gov

Partners *(anyone else providing support)*: N/A

Project Description *(issue being addressed, location, general methodology):* Sea duck demographic parameters are difficult for researchers to estimate at a range-wide scale because their breeding and wintering areas are challenging to access and/or work in. Recent population modeling (Koneff et al. 2017) has provided insight into which demographic parameters are most important for better understanding the harvest potential of these species, hence improving management and providing a sustainable recreational opportunity. There were concerns with the previous approach and a stated need for updated models of sea duck population dynamics. Though data sources are limited, we believe there is sufficient data from small-scale studies and larger monitoring programs that can provide a more complete view of changing sea duck populations.

We propose to use integrated population models to improve estimates of annual survival, estimate the effect of changing harvest regulations on survival, and provide insight into what data needs are most useful for improving demographic rate estimates. Target species are black scoter (Melanitta americana), surf scoter (M. perspicillata), and white-winged scoter (M. deglandi) in eastern North America. Our goal is to integrate Christmas Bird Count trend data with demographic parameter estimates obtained from on-going fecundity surveys and prior knowledge of scoter survival. We propose a one-year project that will utilize the skills of quantitative biologists to integrate the various sources of data and analyze population demographics of scoters in eastern North America, and determine the sensitivity of the model to uncertainty in fecundity and survival rates.

Project Objectives: The primary goal of this project is to obtain a better understanding of scoter abundance trends and survival rates using existing data. We propose to achieve our goal through the following objectives:

1) Build a hierarchical model that links observed population trend data with available demographic data to estimate accurate and precise survival rates.

2) Assess model performance using simulations to determine which parameters the survival estimate is most sensitive to and where managers should collect more data to most improve survival estimates.

3) Incorporate historic changes in harvest regulations as variables to estimate the effects of management actions.

Preliminary Results *(include maps, photos, figures/tables as appropriate):* N/A

Project Status *(e.g., did you accomplish objectives, encounter any obstacles, what are your future plans):*

Funding for SDJV 176 was awarded to Pennsylvania State University in May 2024. We have recruited technical support to aid in data preparation and cleaning. Frances Buderman has met with Tony Roberts, USFWS collaborator, to discuss data needs. We have obtained the necessary data and are working on visualizing and cleaning the data for analysis. Data sources include the parts collection survey, Christmas bird counts, and photo survey data. We will next write out the proposed model in full and begin coding the sampler.

Project Funding Sources (US$). Complete only if funded by SDJV in FY24. This is used to document: 1) how SDJV-appropriated funds are matched, and 2) how much partner resources are going into sea duck work. You may include approximate dollar value of in-kind contributions in costs. Add rows as needed for additional partners.

SDJV (USFWS) Contribution	Other U.S. federal contributions	U.S. non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (name of agency or organization)
43,850					SDJV

Total Expenditures by Category (SDJV plus all partner contributions; US$). Complete only if project was funded by SDJV in FY24; total dollar amounts should match those in previous table.

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding (include only if this was a major element of study)					
Surveys (include only if this was a major element of study)					
Research					43,850