Sea Duck Joint Venture
Annual Project Summary
FY22 (October 1, 2021 – September 30, 2022)

Project Title: Engaging a transboundary expert network to prioritize coastal and marine habitat management for sea ducks in the Salish Sea. SDJV Project # **F22AC01122-00**

Principal Investigators: Dr. David Bradley – Director, British Columbia dbradley@birdscanada.org, Dr. Danielle Ethier – Lead biostatistician dethier@birdscanada.org, Dean Evans – Spatial analyst devans@birdscanada.org, Pete Davidson – Senior Director Conservation Strategy pdavidson@birdscanada.org, James Casey – Fraser River Estuary Specialist jcasey@birdscanad.org.

Partners: Dr. Sarah Converse (University of Washington/ USGS Cooperative Research Unit), Kyle Spragens (Washington Department of Fish and Wildlife), Dr. Trina Bayard (Audubon Washington), Megan Ross (Environment and Climate Change Canada), Dr. W. Sean Boyd (Environment and Climate Change Canada), Kathleen Moore (Environment and Climate Change Canada), Andrew Huang (Environment and Climate Change Canada/ Pacific Birds Habitat Joint Venture), Bruce Harrison (Ducks Unlimited Canada), Monica Iglecia (Pacific Birds Habitat Joint Venture, U.S.), Dr. Laura Farwell (Pacific Birds Habitat Joint Venture).

Project Description: 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 (i.e., biological datasets) end at the international border. In the current project, we aim to overcome this barrier by harmonizing information in a way that assists the agencies responsible for implementing conservation prescriptions, especially in terms of key habitats. In doing so, our project will elevate sea duck needs into conservation planning processes, through convening a network of scientists and managers from both Canadian and U.S. jurisdictions of the Salish Sea.

To achieve our objective, we will implement a three-phase plan to leverage a range of existing resources focused around two sea duck habitat suitability modeling initiatives, one in British Columbia and one in Washington. In **Phase 1**, we will engage a group of experienced analysts working on sea ducks and the habitats that sea ducks use, to identify and assess compatibility of relevant bird and environmental datasets, and assess long-term spatial and temporal correlations between Bald Eagles and priority sea duck species. While this is taking place, we will reach out to the responsible management agencies to understand how we can integrate sea duck habitat values into six linked planning processes that present opportunities to improve conservation of sea duck habitats. In **Phase 2**, we will convene 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. In **Phase 3**, we will complete detailed preparation of the data layers for inclusion in the sea duck model(s), make them available in a geodatabase accompanied by a technical report describing the data integration framework for the model(s), and deliver a webinar to the management agencies focused on how project and model outputs can best inform conservation planning.

Project Objectives: Our overall project goal is to pave the way for sea duck habitat suitability model outputs to inform ongoing conservation planning processes. To this end, we have four specific objectives:

1) Complete data identification and compatibility assessment (both avian and environmental datasets). **2)** Prepare a geospatial database of environmental / biophysical layers: **a.** Compile a comprehensive geospatial dataset (e.g., geodatabase) to support advancement of international sea duck habitat suitability models. **b.** Process and query spatial data consistently and efficiently for analysis within a GIS and render results in a standard format. **c.** Centralize the overall management and coordination of spatial data into an open-access repository. **3)** Assess correlations between numbers of Bald Eagles and sea ducks in specific regions (sub-basins) of the Salish Sea using BC Coastal Waterbird Survey and potentially Christmas Bird Count data, and implications for sea duck habitat modeling. **4)** Align proposed model outputs with conservation planning processes.

To achieve objectives **1)** and **2)**, we will coordinate a transboundary network of relevant technical expertise from the listed collaborating organizations and agencies to **(a)** identify and prepare key environmental data layers that may be suitable predictors of sea duck habitat (using bird data-driven models) and **(b)** identify an approach that either combines or aligns the two sea duck modelling processes underway/planned in British Columbia and Washington respectively. The intent is to create a process that produces Salish Sea ecosystem-scale outputs of key spatio-temporal areas for sea ducks in both near- and off-shore environments.

To achieve objective **4)**, we will engage and learn from resource managers (specific contacts in the agencies leading the conservation planning processes). Specifically, we will identify the types of products and model outputs that would be most helpful to inform each of their processes and use feedback to inform model development.

Preliminary Results: We have completed **Phase 1** of the project, and we are finalizing plans for the next portion of the project. In the initial phase, we convened a virtual meeting of the project partners on 28 June 2022; the group consisted Birds Canada staff plus Sarah Converse, Trina Bayard, Monica Iglecia, Megan Ross, Kyle Spragens, Matt Farr, Laura Farwell, and Kathleen Moore. The meeting outlined the project goals and objectives, and progressed for each partner to speak to the dataset that they manage and the particular limitations to integration with the larger

dataset. These limitations include identified variation in the data collection protocol such as the survey timing and spatial scales over which data have been collected.

We have made good progress in hosting the Puget Sound Seabird Survey dataset in a database alongside the BC Coastal Waterbird Survey dataset. The potential of incorporating Bald Eagle abundance and distribution data from the sources above, as well as data from eBird and the Christmas Bird Count data was discussed in the June meeting. Additional data sets are being considered for inclusion in the project, such as the Midwinter Aerial Seabird Survey collected by the Washington Department of Fish and Wildlife, the At-Sea Surveys conducted by ECCC (distance sampling) and Salish Sea Atlas (fixed width transects). ECCC-CWS is also partway through collecting Surf and White-winged Scoter GPS locations that span the Canada-US border, and will hopefully be hosted as final data products on this project.

Data ownership was discussed at the meeting at length, as well as ways that the group can overcome these issues when data use is restricted. We will likely host those data that are feely available in a common database, and offer links to those data with use restrictions. The available of covariate datasets to accompany each dataset was also discussed, and a list of this covariate data has been compiled for inclusion in the final project outputs.

Project Status: **Phase 2** of the project is well underway, with dates for a 2-day, in-person meeting planned for early November at the Canadian Wildlife Service office in Delta, BC. This meeting will be with project partners from Washington and elsewhere in Canada. At this meeting, we will hash out the various datasets and make decisions about the project outputs and presentation to land managers and key conservation decision makers in British Columbia and Washington. We anticipate that Phase 2 will be completed by the end of 2022. The final phase of the project is on track to take place in January-May 2023.

Project Funding Sources (US$):

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)
$46,574					USFWS
		$40,000			University of Washington
		$5,000			Washington Department of Fish and Wildlife – Waterfowl section
				$11,930	Birds Canada
				$25,000	PBHJV (Ducks Unlimited Canada, ECCC)

Total Expenditures by Category (SDJV plus all partner contributions; US$):

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				$128,504	**$128,504**