Sea Duck Joint Venture
Annual Project Summary
FY 2017 – (October 1, 2016 to Sept 30, 2017)

Project Title: SDJV PROJECT #148: MEASURING PENTOSIDINE IN SKIN BIOPSY SAMPLES TO RELIABLY AGE SCOTERS –(Agreement F16AC00145)

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Project Description (issue being addressed, location, general methodology):

A priority for the SDJV is to determine survival rates for surf scoters wintering in specific areas on the Pacific and Atlantic coasts, with emphasis on adult birds. To date, estimates of SUSC survival and longevity have primarily been based on hunter harvest returns of banded scoters. Currently, data available to evaluate surf scoter annual survival and longevity is extremely limited and consists of recovery and recaptures of banded birds through relatively small-scale capture efforts. The initiation of larger and longer-term capture and banding efforts of surf scoters would provide insightful, information but has its limitations due to the costs and effort required to perform sea duck banding projects and the dependency on hunters reporting banded birds. Alternative or parallel studies are needed to enhance evaluation of surf scoter survivorship. For this particular priority, we addressed information gaps on scoter survival rates and longevity through the establishment of a scoter age growth curve.

Several captive bird facilities in the US contain known-aged surf scoter and white-winged scoters and from a wide range of ages spanning from hatch year through 12 yrs in surf scoters and hatch year through 17 yrs in white-winged scoters. Skin biopsies were collected from known-aged captive individuals, to create a surf scoter and white-winged scoter quantitative age index curve. An accurate scoter index curve would allow the subsequent collections and aging of unknown-aged scoters, either through live-capture and sampling efforts or the use of parts collections, such as hunter shot birds or wings from the Annual Wing Bee.

Objectives *(should identify how the project addresses SDJV priorities*):

1) Utilize captive rearing facilities to collect skin biopsy samples from known-aged captive surf scoter and white-winged scoter.
2) Measure pentosidine concentrations in scoter skin samples from known-aged individuals through laboratory analysis.
3) Compare the quantitative age index curve between surf scoters and white-winged scoters to determine if results are comparable among scoter species.
4) Establish a quantitative scoter age index tool for wildlife managers and researchers to utilize in evaluating surf scoter and white-winged scoter survival rates, longevity, and harvest assessments through the subsequent sampling of live, deceased (carcasses), or wings (USFWS Wing Bee/hunter harvest) of unknown-aged scoters.

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

We collected a total of 86 skin samples from 29 surf scoters and 33 white-winged scoters (Table 1) of known-age among three captive facilities: 1) Livingston Ripley Waterfowl Conservancy, 2) USGS Patuxent Wildlife Research Center, and 3) Dry Creek Waterfowl. Among these samples, 9 white-winged scoters were previously deceased and from those individuals, we collected skin samples from three distinct areas: 1) patagium, 2) breast, and 3) shoulder. Our intention is to compare pentosidine concentrations between differing locations on the bird, as previous studies have found stronger correlations at different sampling areas, depending on species.

Table 1. Summary of tissue samples collected from captive surf scoter and white-winged.

Species	**n**	**Age Range (yrs)**
SUSC	29	0.4 – 13.7
WWSC	33	0.3 – 18.2
Totals	**62**	**0.3 – 18.2**

The Toledo Zoo experienced delays in their animal care permitting and therefore samples were collected from two white-winged scoters in April 2017. Samples have been shipped to BRI and are awaiting analysis at WVU.

Preliminary data analyses have been conducted. Skin samples collected from the breast appear to be the best predictor of age in scoters (Figure 1).

Further data analyses are required to develop a scoter age curve using skin samples measured for pentosidine concentrations.

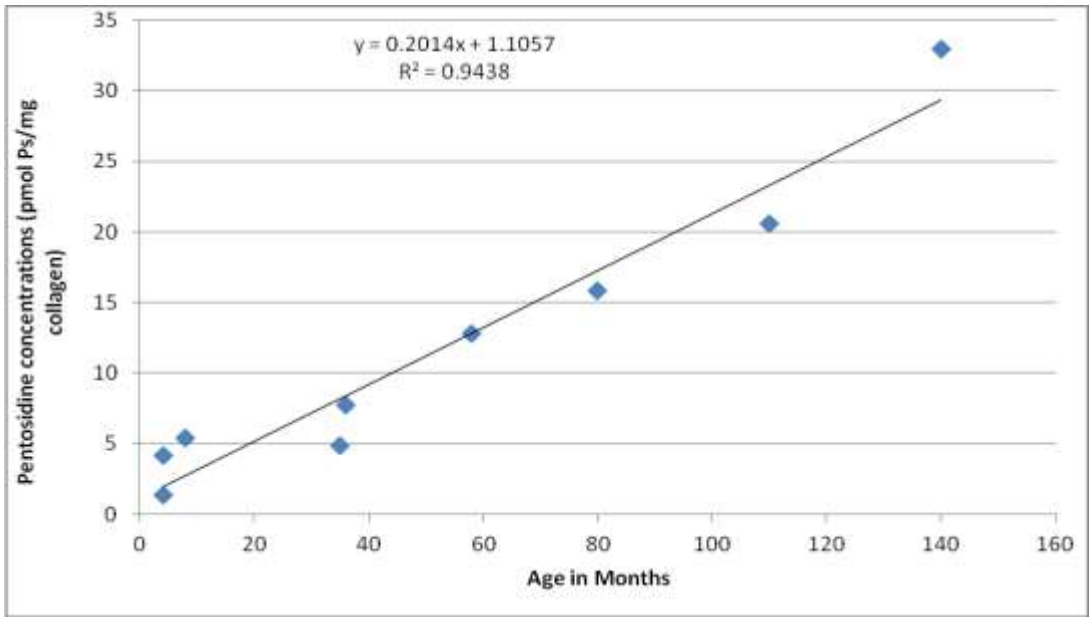

Figure 1. Pentosidine concentrations in relation to age (months) from skin samples collected from the breast of white-winged scoters.

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)
$8,460					SDJV
		$1,692			BRI
		$350			Livingston Ripley WC
		$1,000			Dry Creek
	$500				USGS Patuxent
		$500			Toledo Zoo
		$2,050			West Virginia Univ.
		$500			Virginia Tech Univ.

Total Expenditures by Category (SDJV plus all partner contributions; US$). Complete only if project was funded by SDJV in FY16; 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	**$3763**	**$3763**	**$3763**	**$3763**	**$15,052**