Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 03 – (October 1, 2002 to Sept 30, 2003)

Project Title: No. 3: Population Demography of Surf Scoters Wintering in the Strait of Georgia, British Columbia

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Project Description (*issue being addressed, location, general methodology)*:
Pacific Surf Scoter populations appear to be declining, based on surveys on breeding grounds in Alaska. Without knowledge of survival, recruitment, and dispersal rates it is impossible to identify demographic causes of population changes, the first prerequisite for effective management. We intend to document important demographic attributes of Surf Scoter aggregations wintering in the Strait of Georgia, British Columbia, consider implications for regional population processes, and evaluate effects of local human impacts on population demography.

This project includes research designed to understand recruitment in Surf Scoters, and plans for surveys of recruitment and abundance at sites throughout the Strait of Georgia. The management value of this work will be enhanced through collaboration with ongoing CWS studies of contaminants in Surf Scoters and Surf Scoter interactions with shellfish mariculture.

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

(1) Build on findings of Surf Scoter recruitment studies to develop a mid-winter survey protocol for assessing changes in population numbers and sex/age ratios for additional sea duck species in the Strait of Georgia.
(2) Estimate other demographic attributes (e.g., survival in association with ongoing studies of scoter – aquaculture interactions) and use these data in population models.

Preliminary Results:

A manuscript, which evaluated the utility of age ratios as an index of recruitment by Surf Scoters, was submitted for publication. For surveys conducted during 2000 through 2003, an overall male age ratio of 0.103 was estimated, with annual variations ranging from 0.068 (±0.015 SE) to 0.130 (±0.026 SE) (first-year males / males total). Flock composition patterns indicated first-year males did not distribute independently; rather there was a tendency for them to associate with other first-year males. Age-class proportions did not vary among substrate types; however, higher proportions of first-year males were found in sites with low exposure to wind and waves. To determine the efficacy of using male age ratios as an index of recruitment a power analysis, which incorporated overdispersion by age-classes, was used to determine the sample sizes required for precise estimates of the proportion first-year males. Samples of approximately 700 and 3000 total males were required to obtain 95% confidence limits within ±2% and ±1%, respectively. We conclude that winter age ratio estimation can be a useful index of recruitment for Surf Scoters when adequate samples are selected representatively from available habitats

Project Status *(e.g., did you accomplish objectives, encounter any obstacles, do you have plans for the future?)*

Through Sam Iverson's thesis, a published manuscript, and a submitted manuscript, the background work has been done to allow estimation of recruitment via observations of Surf Scoter males during mid-winter. Our intention is to build upon findings of Surf Scoter recruitment studies to develop a mid-winter survey protocol for assessing changes in population numbers and sex/age ratios for additional sea duck species. During January and February 2003 pilot surveys were conducted in the Strait of Georgia, BC, to determine the efficacy of concurrently surveying Surf Scoter, Black Scoter, White-winged Scoter, Harlequin Duck, Barrow's Goldeneye, Common Goldeneye, and Bufflehead populations. If funding is secured, we hope to expand this pilot study to include a larger area, thus increasing sample size and our ability to confidently estimate

sex/age ratios, determine sex, age, and species-specific densities and habitat associations, and establish baseline abundances.

Project Funding Sources (US$) (complete only if funded by a SDJV partner e.g., USFWS, CWS, DU, USGS, or Flyway rep; this is used to document how SDJV appropriated funds are matched): NOTE: this project is unfunded.

SDJV (USFWS) Contribution	Other U.S. federal contributions	U.S. non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (agency or organization)
			$11,350		Canadian Wildlife Service

Total Expenditures by Category (US$) (complete only if project is funded by a SDJV partner e.g., USFWS, CWS, DU, USGS, or Flyway rep; dollar amounts should include all partner contributions):

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					
Surveys				$8,150	$8,150
Research				$1,200	$1,200
Communication					
Coordination				$2,000	$2,000