# Sea Duck Joint Venture
# Annual Project Summary
## FY 2016 – (October 1, 2015 to Sept 30, 2016)

**Project Title:  SDJV Project #149:**Population Dynamics of American Common Eider (*Somateria mollissima dresseri*): Estimating Population Growth and Recruitment Rates.

**Principal Investigator(s)*:***

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**Project Description:**
The current American Common Eider population estimate is around 300,000 birds and is among the most commonly harvested sea ducks in several coastal regions of eastern Canada and U.S. The sustainable harvest rate was estimated around 10%, and harvest was estimated to be about 32,000 birds (mean harvest 1998 to 2003) which exceeded the estimate of sustainable harvest for this subspecies. Although the distribution and relative abundance of American Common Eider has been well described, there exists no comprehensive monitoring program for this subspecies. Despite the lack of population data, waterfowl managers are concerned about the status of this population, especially across the southern portion of their breeding range where numbers appear to be declining (Maine, New Brunswick and Nova Scotia).

Although there is no long-term large scale survey program for *S. m. dresseri* there have been several large banding programs focused on banding adult females on the breeding colonies.  Using Pradel's (1996) models, capture-recapture data can be used to estimate population growth and recruitment rates. These models have been used successfully to estimate recruitment and growth rates for a subset of the eider banding data in the St. Lawrence Estuary, Québec and for northern Newfoundland and Labrador.

**Objectives:**

- Compile the capture-recapture histories for the various banding datasets for *S. m. dresseri*.
- Estimate contemporary recruitment and population growth rates for *S. m. dresseri* for different segments of the population (i.e. for the period after 2000).
- Where data are available, estimate and compare past rates of recruitment and population growth for *S. m. dresseri* to current estimates.

**Preliminary Results*:***

Population growth rate has been estimated for 12 colonies so far (Table 1). For Quebec, these estimates were compared with nest numbers obtained during the down harvest in four colonies and there is a good agreement between the two methods.

**Table 1. Population growth rate estimated through CMR techniques.**

| State/Province | Colony | Lambda (95% CI) |
|---|---|---|
| Québec | Blanche | 1.07 (1.04 - 1.10) |
| | Bicquette | 0.99 (0.93 - 1.05) |
| | Pommes | 1.00 (0.98 - 1.03) |
| | Fraises | 1.06 (1.03 - 1.09) |
| | Laval | 1.01 (0.96 - 1.05) |
| | Pot | 1.04 (1.01 - 1.08) |
| | Ragueneau | 0.95 (0.82 - 0.99) |
| | Œufs | 1.02 (0.98 - 1.07) |
| Nova Scotia | Tobacco | 0.98 (0.93 - 1.04) |
| | Big White | 1.00 (0.96 - 1.03) |
| | Goodwins | 0.82 (0.75 - 0.89) |
| | John's | 0.95 (0.91 - 0.99) |

**Project Status:**

All the data have been received and there is still some cleaning to be done in the Maine, New Brunswick and Newfoundland data bases (Table 2). Analyses have been done for Quebec and Nova Scotia but there is still more validation to be done through Goodness-of-fit tests. Finally, recruitment for each colony will be estimated once the growth rates are obtained and validation completed.

We still plan to hold a meeting with all PIs to present and discuss these results. In addition, an abstract for an oral communication has been accepted for the next Sea Duck Conference in San Francisco, February 2017.

**Table 2. Project status for the different regions.**

| State/Province | Team | Database received | Data management & importation in MARK | CMR Analysis | Test of Goodness of fit |
|---|---|---|---|---|---|
| Québec | Jean-François Giroux | Yes | Done | Done | Done with Release, not all done with UCare. Some problems of overdispersion and transients suspected |
| Maine | Brad Allen and Daniel McAuley | Yes | Some questions unanswered on database and some reorganization to do. | No | No |
| New Brunswick | Scott Gilliland | Yes | Met S. Gilliland who still have to clean database. | No | No |
| Newfoundland | Mark Gloutney | Yes | Some questions unanswered on database and some reorganization to do. | No | No |
| Nova Scotia | Randy Milton | Yes | Done | Analysis done for four colonies (most of the other have few data or many years without capture) | Done with *Release*: no overdispersion. Still have to do it with *Ucare* |