

Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2007 – (October 1, 2006 to Sept 30, 2007)

Project Title: SDJV Project #89: Foraging values of *Mulinia lateralis* and *Ischadium recurvum*: the energetic effects on surf scoters wintering in the Chesapeake Bay.

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Partners: University of Maryland, Friends of Patuxent Wildlife Research Center

Project Description: Reports of the Atlantic coast surf scoter (*Melanitta perspicillata*) populations have indicated steady declines, which has necessitated further research on surf scoter populations. One of the primary wintering areas for surf scoters is the Chesapeake Bay. While wintering in the Bay the ducks primarily prey on two food items, the hooked mussel (*Ischadium recurvum*) and dwarf surf clam (*Mulinia lateralis*). Over the last 50 years, the habitat quality for these prey items has undergone drastic changes. The decline in oyster reefs and the resultant decline in availability of high quality mussels may be causing the surf scoters to switch to a more prolific food item, the dwarf surf clam. Our study will quantify the foraging values (costs-benefits) of these two prey items for surf scoters in order to evaluate the effects of this possible shift on the foraging energetics of this declining duck population.

Objectives: The overall goal of our study was to compare the relative foraging values of hooked mussels and dwarf surf clams to wintering surf scoters on the Chesapeake Bay. To achieve this goal we achieved the following objectives:

1. Determined the nutrient composition, crushing resistance, and digestibility of dwarf surf clams and hooked mussels. In addition, we measured the byssal strength of hooked mussels.
2. Determined the mean retention times for dwarf surf clams and hooked mussels in the gut of surf scoters.
3. Determined the functional responses of surf scoters fed four densities of two size classes of dwarf surf clams and hooked mussels.
4. Quantified the energy balance (foraging value) for surf scoters feeding on dwarf surf clams or hooked mussels using a compartmental model.

Preliminary Results:

Table 1. Means (\pm 1 SD) of body mass before and after feeding trials; of food (dry mass), ash, lipid, nitrogen, and energy ingested; of guano (dry mass), ash, lipid, nitrogen, and energy excreted; and of assimilation efficiency for energy (AE), nitrogen balance (NB), and AE corrected for nitrogen balance (AE_N) for surf scoters fed 25 g fresh mass (including shells) of hooked mussels and dwarf surf clams. (TBD = To be determined)

		<i>I. recurvum</i>	<i>M. lateralis</i>
		n = 8	n = 8
Body Mass	Initial Mass (g)	783 \pm 97	775 \pm 82
	Final Mass (g)	705 \pm 60	700 \pm 48
	Mass Loss (%)	5.0 \pm 2.9	5.0 \pm 2.4
Ingesta	Food (g)	18.19 \pm 5.346	24.65 \pm 1.052
	Ash (g)	15.26 \pm 4.485	20.68 \pm 0.882
	Lipid (g)	0.111 \pm 0.033	0.150 \pm 0.006
	Nitrogen (g)	TBD	TBD
	Energy (kJ)	47.35 \pm 13.92	TBD
Excreta	Guano (g)	TBD	TBD

	Ash (%)	40.4 ± 8.62	38.6 ± 7.78
	Lipid (%)	0.90 ± 0.30	1.00 ± 0.30
	Nitrogen (g)	TBD	TBD
	Energy (kJ/g)	8.34 ± 1.16	8.65 ± 1.78
Assimilation	AE (%)	TBD	TBD
	NB (kJ)	TBD	TBD
	AE _N (%)	TBD	TBD

Project Status: All experiments are completed and presently analyses are being completed. The above table represents preliminary results as proximate analyses are completed on the data. All results will be analyzed and reported in a dissertation in December 2007.