Food Selection Among Atlantic Coast Seaducks in Relation to Historic Food Habits

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INTRODUCTION

The distribution and abundance of Atlantic Coast wintering populations of seaducks are related to many factors, but most important is the quantity and quality of food organisms. Preliminary observations indicate that most species of seaducks show little changes in food habits and still are feeding on mollusks species that have traditionally formed the bulk of their diets. More data of seaduck food habits were needed, however, to totally understand possible changes that have occurred in the wintering habitat of seaducks and how these changes could affect their distribution and abundance. To evaluate potential changes it was necessary to obtain large samples of seaducks from hunters and compare the results of food habits analyses with those historic studies conducted by Cottam, McGilvrey, Stewart, and Stott. The results might be related to degradation of habitat conditions in wintering areas, such as Chesapeake Bay, by an increasing human population.

METHODS

Food selection among Atlantic Coast seaducks during 1999-2005 was determined from hunter-killed ducks and compared to data from historic food habits file (1890-1985) for major migrational and wintering areas in the Atlantic Flyway. Food selection was determined by analyses of the gullet (esophagus and proventriculus) and gizzard of 860 ducks and summarized by aggregate percent for each species. All analyses were conducted at USGS Patuxent Wildlife Research Center laboratories and voucher specimens were stored for future reference. When sample size was adequate comparisons were made among age and sex groupings and also among local sites in major habitat areas.

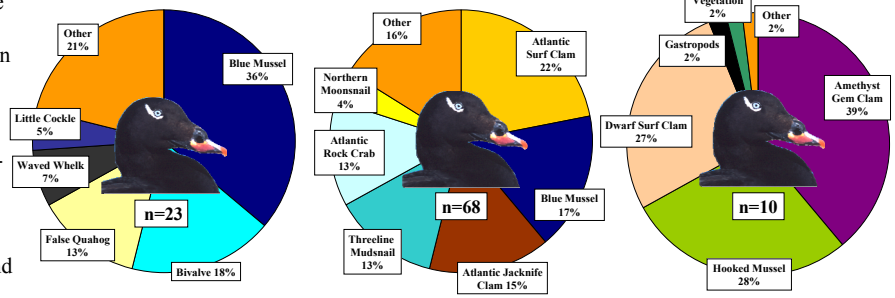
RESULTS

The blue mussel (*Mytilus edulis*) was the predominant food of common eiders in the Maritimes (43%) and Massachusetts (76%). Other food of eiders included the Atlantic rock crab (*Cancer irroratus*) and threeline mudsnail (*Nassarius trivittatus*).

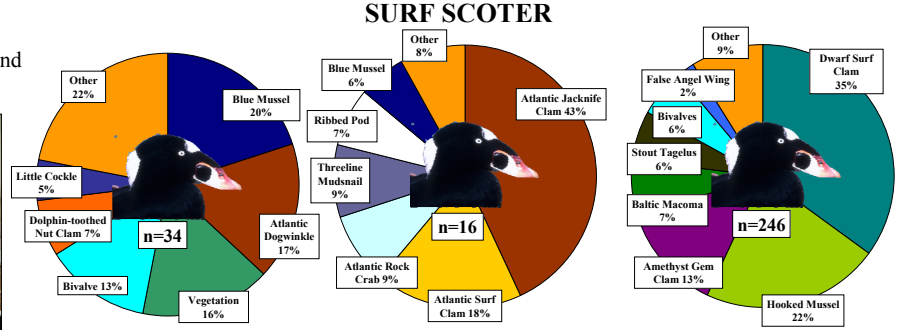
COMMON EIDER			
Food Item		Location	
		Maritimes	Massachusetts
Common Name	Scientific Name	n=113	n=128
Blue Mussel	*Mytilus edulis*	43%	76%
Green Sea Urchin	*Strongylocentrotus droebachiensis*	16%	Trace
N. Horse Mussel	*Modiolus modiolus*	10%	
Arctic Rock Borer	*Hiatella arctica*	3%	
Atlantic Rock Crab	*Cancer irroratus*		8%
Threeline Mudsnail	*Nassarius trivittatus*		3%
Other Species		28%	13%

Maritimes Massachusetts Chesapeake Bay

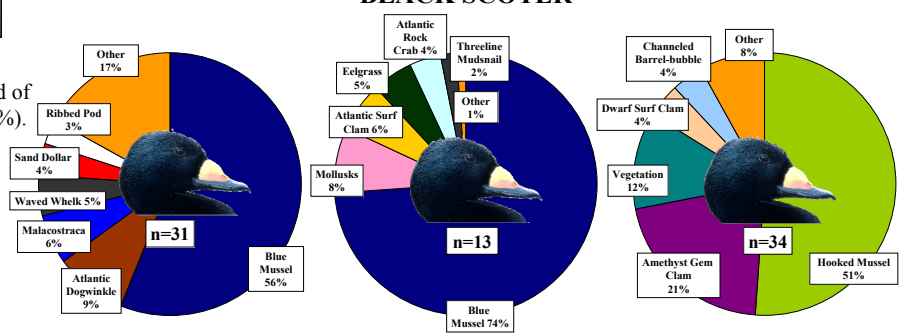
WHITE-WINGED SCOTER



SURF SCOTER



BLACK SCOTER



Scoters in the Canadian Maritimes fed predominantly on the blue mussel (37%), whereas in Massachusetts only the black scoter fed predominantly on blue mussels. The surf scoter fed mostly on Atlantic jackknife clam (43%) and Atlantic surf clam (18%) and the white-winged scoter diet was fairly evenly mixed among Atlantic surf clam (22%), blue mussel (17%), Atlantic jackknife clam (15%), and threeline mudsnail (13%).

FOOD ITEM		CHESAPEAKE BAY	
Common Name	Scientific Name	Long-tailed Duck n=35	Bufflehead n=36
Dwarf Surf Clam	*Mulinia lateralis*	30%	59%
Amethyst Gemclam	*Gemma gemma*	28%	Trace
Hooked Mussel	*Ischadium rrecurvum*	15%	Trace
Barnacle	*Balanus sp.*	7%	Trace
Baltic Macoma	*Macoma balthica*	3%	7%
Soft Shell Clam	*Mya arenaria*		6%
Other Species		17%	28%

In the Chesapeake Bay the hooked mussel (*Ischadium recurvum;* 34%) was the most important food organism for scoters in general, but the dwarf surf clam (*Mulinia lateralis*; 35%) was selected most by surf scoters and the amethyst gem clam (*Gemma gemma; 39%*) was selected most by white-winged scoters.

The amethyst gem clam was also a predominant food (28%) of long-tailed ducks in Chesapeake Bay, along with the dwarf surf clam (30%). Buffleheads in the Bay fed mainly on dwarf surf clam (59%) and common goldeneyes fed on a mixed diet of hooked mussel and Atlantic Rangia, *Rangia cuneata.* No major differences were noticed between the sexes in regard to food selection in any of the wintering areas for any of the seaduck species.

Comparisons to historic food habits in all areas failed to detect major differences. However, several invertebrate species recorded in historic samples were not found in current samples and two invasive species (Atlantic Rangia and the green crab, *Carcinas maenas*) were recorded in modern samples, but not in historic samples. Benthic sampling in areas where seaducks were collected showed a close correlation between consumption and availability.

CONCLUSIONS

Each seaduck species appears to fill a unique niche in regard to feeding ecology, although there is much overlap of prey species selected. Previous studies of food habits of some species of diving ducks, especially the pochards, have shown major changes in their use of wintering habitat since the decline of submerged aquatic vegetation (SAV) in the 1960s. The fact that we do not see major differences in the current food habits of seaducks compared to historic records could indicate that degradation of coastal habitat has not impacted the deeper areas that are typically used by seaducks for feeding. It is very important to know more about the water conditions in the deeper parts of the Bay where seaducks typically feed. These areas many be more vulnerable to anoxic conditions during drought or high temperature conditions that could have serious impacts on seaduck distribution and abundance.

Understanding the food habits of seaducks in coastal wintering areas will give managers a better understanding of habitat changes in regard to future environmental perturbations and help in the conservation of these species.