[illegible] Southwest Greenland provides wintering grounds for 70% (~460,000) of the northern common eider ([illegible]) population. From 241 gullet samples (esophagus and proventriculus content) collected over three winters (1999–2002) near Nuuk, we identified 39 species consumed by the eiders. In contrast to studies elsewhere, fresh mass of the diet was dominated by soft-bottom species: the bivalve [illegible] (32.8%) and the polychaete [illegible] spp. (24.2%). The hard-bottom blue mussel ([illegible]), usually the dominant prey of common eiders, was only the fourth most important diet species (7.5%). Overall, bivalves accounted for 56% of the diet. Twenty-seven prey species were minor foods with aggregate fresh mass of only 5.5%. Diets of males and females were similar, whereas juveniles consumed greater mass of crustaceans and less of bivalves. Diet diversity was higher in mid-winter than late winter, and higher in

fjord birds, however, based on a shorter period (April only) and fewer birds: 11 juveniles, 10 immatures and 10 adults. The number of samples and their distribution over time and age-classes did not allow a robust year-to-year comparison.

Based on the fresh mass of the different food items, weighed to the nearest 0.1 g., we used Schoener's Index (SI) to calculate the overlap in diet between periods, habitats, age-classes and sexes (Schoener 1970):

$$\mathrm{SI} = 1 - \frac{1}{2}\left(\sum_{i=1}^{n} \left| p_{xi} - p_{yi} \right| \right);$$

where n is the number of prey species (or categories) and p_{xi} and p_{yi} are the relative proportions (fresh mass) of a given prey species in the diet of age-class x and y, between sexes x and y, in periods x and y, or within habitats x and y. As a measurement of diet diversity, we calculated the Shannon–Weaver Diversity Index (H', Zar 1999):

$$H' = \frac{n \log n - \sum_{i=1}^{k} f_i \log f_i}{n};$$

where k is the number of categories, f_i is the number of observations in category i, and n is the sample size. To test for difference in diversity between two groups we used a t-test calculated as (Hutcheson 1970; Zar 1999):

$$t = \frac{H'_1 - H'_2}{s^2_{H'_1}}$$

not differ between mid-winter (12.2 ± 0.4 mm) and late winter (12.4 ± 0.3 mm) ([illegible] = –0.41, [illegible] = 316, [illegible] = 0.68) for [illegible] and for the third most important bivalve species, [illegible] (11.4 ± 0.3 and 12.1 ± 0.5 mm, respectively, [illegible] = –1.32, [illegible] = 355, [illegible] = 0.19).

(Frimer 1997). The second most common prey species in our study, the polychaete [illegible] spp., was also the second most common prey for the king eiders in Disko Bay (Frimer 1997). The consumption of soft-bottom community taxa like [illegible] and [illegible] contrasts to most other studies, where common eiders fed mainly over rocky substrates and kelp beds (e.g. Bustnes and Erikstad 1988; Guillemette et al. 1993).

Our study confirms local knowledge, and the study of Frimer (1997), that eiders in west Greenland occasionally eat fish (Table 1). Both in Nuuk and in the Disko Bay area the fish preyed upon was [illegible] spp., which probably was taken while buried in the sediment (Frimer 1997). In northern Norway, Bustnes and Erikstad (1988) found that the eggs of lumpsuckers were important spring diet for the common eider. Our sampling period did not include the peak spawning period for the lumpsucker in Southwest Greenland (May, Salomonsen 1990) and probably explains why we found only one eider containing large quantities of lumpsucker eggs (Table 1).

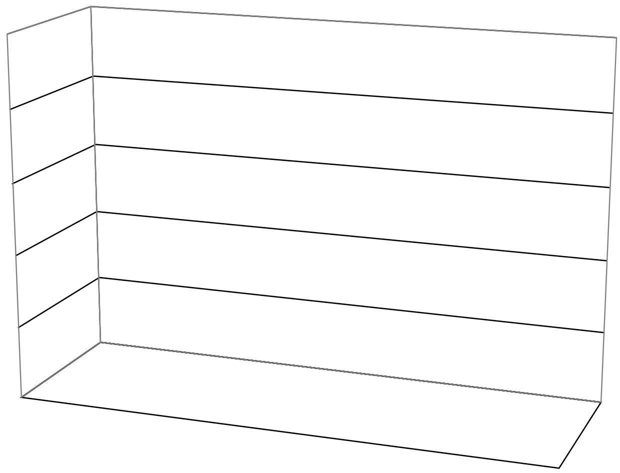
[illegible]

Diet composition

In a wide range of Arctic as well as temperate locations, blue mussels are the dominant prey of common eiders (e.g. Bagge et al. 1973; Goudie and Ankney 1986; Bustnes and Erikstad 1988; Nehls and Ketzenberg 2002), similar to our Nepisat Sund mid-winter data (Fig. 3). However, on average, blue mussels were only the fourth most common prey species in the Nuuk study area. In terms of both per cent occurrence and aggregate per cent fresh mass, [illegible] was more than three times as important (Table 1). Only one other study observed a similar dominance of [illegible] clams in the diet: 67% of king eiders moulting in the Disko Bay in central West Greenland consumed [illegible]

Sex, age, season and sampling

Our results support previous findings that the diet of male and female eiders is much the same (Pethon 1967; Bustnes and Erikstad 1988; Frimer 1997) but also, that food preferences changed with age: young birds selected more readily digestible crustacean and annelid prey species (Pethon 1967; Bustnes et al. 2000). This pattern may either be a consequence of juveniles having higher nutritional demands related to body mass, growth or less developed gizzards, or be related to poor body condition (Bustnes et al. 2000; Merkel 2006). Some juveniles may behave as ‘‘risk-prone foragers’’ and seek the high-energy g1967fi(1n5TJ-c0 0 1 scnTD[(to)-4



Cantin et al. 1974; Bustnes and Systad 2001). In these studies, the occurrence of crustaceans in the diet peaked during autumn and early winter and may be important for maintenance of a waterproof plumage during moult (Pethon 1967).

Our study demonstrates the need to control for sampling parameters, such as time and location, when collecting diet samples. Prey selection by eiders can vary significantly only short distances apart (e.g. coast versus fjord, Table 2, Fig. 2) or between mid-winter and late winter at one specific location (Nepisat Sund, Fig. 3). To what extent the diet composition differed or changed due to diet preferences among birds, or simply because prey availability differed between locations and changed over time, is not clear (about prey depletion, see later). We suspect, however, that the less diverse diet of fjord birds was a reflection of prey availability. In fact, we believe that the differences found are underestimated. Shallow waters are limited in the fjord and eiders often feed in the sublittoral zone of steep cliffs, which are heavily dominated by blue mussels (F. Merkel, personal observation). However, since all our fjord samples originate from lumpsucker gillnets and since these are only put out on shallow waters, the ‘‘steep-cliff foragers’’ are probably not represented in our dataset. In contrast, we expect the shallow waters used for gillnetting in the coastal area to be largely representative of eider feeding habitats.

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