Response to J. C. Haney

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We value the comments of Haney (1985) concerning our paper on methods of counting seabirds at sea (Tasker et al. 1984), particularly because they are based on experience gained in tropical and subtropical oceans. Many of Haney's points are concerned with interpretation rather than method design, however, and these would apply equally to many methods other than our suggested standard. Haney's first point concerns the problem caused by attempting to compare a fauna containing many "stationary" flying birds with one containing many birds on the ocean surface. We maintain that the suggested standard for counting flying birds does provide a good index of density, and that this will allow for bias caused by some species moving faster than others or even for the intraspecific speed differences caused by such factors as wind. We accept that the density estimates produced have to be interpreted cautiously, as in any count; our method is aimed at reducing considerably one biasing factor in the initial collection of the data. We agree with Haney's comments on the importance of patch size, which should certainly be taken into account in sampling design.

Scale-dependent heterogeneity of marine environments certainly influences apparent abundances of seabirds at sea. These processes have rarely been examined, and we agree that time intervals shorter than 10 min may be required under certain circumstances. The great majority of studies to date (see Tasker et al. 1984: table 1) examined seabird distribution on a large scale; at these levels, the variation caused by small-scale heterogeneity in the environment will be less important. We would certainly recommend examination of results to determine the degree of variation in counts within large data sets (see Gould et al. 1982).

A stratified sampling system would be sensible if the environmental parameters affecting seabird distribution were known. However, in many cases the factors are not known, and thus it is often better to stratify results after the study. Stratified sampling would not affect our suggested method.

We consider that some form of standardization is desirable between studies of seabirds at sea. The standard we have suggested does not preclude answering many of the questions asked by seabird biologists. It allows comparison of studies at least within a faunal region, and perhaps more importantly, it allows long-term studies in one location. We accept that it may not be possible to compare, for example, tropical with boreal fauna. Comparability between studies is important in areas where several projects may overlap. It is difficult at present to determine, for instance, the numbers of birds that may be present off the east coast of North America. Three recent studies each used different methods (Brown et al. 1975), Powers 1983, Haney unpubl. data) in three adjacent sections of ocean. A similar problem occurred in Alaskan waters, causing some problems in interpreting results from that area (Hunt et al. 1981). Because studies on oil pollution impact or energy flow are international, and because the physical factors that may influence seabird distribution are affected by long-term environmental changes, a standard method is necessary to ensure maximum long-term comparability of results.

We accept that the objectives set in a project must determine the precise methods used (Tasker et al. 1984: 569) and do not call for "universal standardization" (Haney 1985). We do, however, feel that marine ornithologists have not considered the problems of bias at all seriously in the past. We hope that our suggested standard will reduce methodological variation, thus allowing bird-density variation to be examined more closely. Until more objective methods of calculating seabird density become available (for example, computer interpretation of small-area satellite photographs), human observers will continue to function as seabird counters. We have sought to reduce the inevitable variables inherent in this counting, and continue to advocate a standard system of data collection.

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Dominance Structuring of a Red-winged Blackbird Roost: A Comment

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Weatherhead and Hoysak (1984) recently tested one aspect of Weatherhead's (1983) hypothesis concerning the structure of Red-winged Blackbird (*Agelaius phoeniceus*) roosts. They predicted that hatching-year (HY) males should be encountered in more vulnerable roosting sites in peripheral positions, over shallower water, and in sparser vegetation than after-hatching-year (AHY) males. The 1984 results are viewed as "consistent with the predictions." After reviewing the methods and results of Weatherhead and Hoysak (1984), I submit that this claim is not justified.

According to Weatherhead and Hoysak (1984), roost structuring is achieved through dominance of AHY over HY birds, dominance being expressed through aggressive displays. I see several difficulties with this reasoning. First, aging the birds is difficult, especially as the daylight decreases, and some proportion of HY birds may have been classified as AHY. The authors maintained that this did not exceed 15%, but the basis for this claim is not stated clearly. Second, the act of chasing represented less than 3% of all the observations, which made this behavior a rare event and thus susceptible to observer-expectancy bias (Balph and Balph 1983). This is especially pertinent because Red-winged Blackbirds were aged *after* their behaviors were noted. Considering the small sample size, only a few misclassifications are needed to alter the significance of the results. Third, the authors failed to identify the age of both birds implicated in aggressive encounters: "Because only the age of the focal bird was recorded, we do not know the age of the other birds involved in observations of chasing."

This is particularly important because the number of observations that involved chases was very small: 7 of 330 (2%) observations for AHY and 6 of 180 (3%) observations for HY. The time devoted to the observations was clearly insufficient (16 observation periods lasting 1–2 h each) to record an adequate number of observations involving chases. In fact, it is quite possible that some of the observations included HY being chased by other HY, as well as AHY chasing other AHY. *Dominance* refers to a relationship between two individuals that may have different attributes, such as different age or plumage coloration (Bernstein 1980, C. Barrette and D. Vandal pers. comm.). During an encounter between two individuals, it is essential to record the attributes of the initiator *and* the receptor to establish the relationship as dominant-subordinate (Lehner 1979); otherwise, the application of the concept of dominance is not appropriate. I consider that the conclusion reached by Weatherhead and Hoysak (1984: 553) is unacceptable based on the available data and especially on the procedures used to gather the information: "Consistent with our predictions, HY males were chased more often than AHY males and chased other males less often. The combined differences are significant ... and indicate that HY males were subordinate to AHY males."

Weatherhead and Hoysak (1984) concluded that an interior roosting position appeared to be microclimatically superior and less vulnerable to predation. This is speculative because no measure was taken to substantiate this contention. The relative position of the birds was recorded relative to the *nearest edge of the patch of vegetation* and not relative to the *position within the entire roost.* Moreover, the difference in the distance between a central and an edge position was only 50 cm. AHY were found in a more central position within a patch than HY, but that patch may have been on the periphery of the roost near the mainland shore, therefore increasing vulnerability to predators and unfavorable climatic conditions.

HY blackbirds were found over deeper water than AHY, which was contrary to the predicted pattern. The authors explained this result on the basis that HY were observed more frequently along the edge of vegetation adjacent to the open water. In their Fig. 1 it would appear that this may be the most secure roosting site because if potential predators such as raccoon (*Procyon lotor*) and domestic cats (*Felis catus*) come from the nearest land, they would have to wade or swim in at least 30 cm of water and cross the entire stand of cattail before reaching HY birds. Moreover, they would encounter AHY on their way before reaching the HY blackbirds.

Finally, Weatherhead and Hoysak (1984) concluded that AHY were found in denser vegetation than HY, which supports their initial predictions. However, the average density of stems of *Typha* per 0.25 × 0.25-m quadrat (total area of 0.0625 m^2, and not 0.625 m^2 as reported in the paper) was 2.31 for

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