



## 2008 San Francisco Bay Shorebird Census

**San Francisco Bay is a great place for shorebirds!** The salt ponds, tidal flats, marshes and seasonal wetlands provide important habitat for over a million resident and migrant shorebirds each year. This extremely high number of birds, dependent on the Bay, resulted in its designation by the Western Hemisphere Shorebird Reserve Network as a site of Hemispheric Importance for shorebirds. The Bay's importance to shorebirds also contributed to its designation as an Important Bird Area by the National Audubon Society. While it is a great place for shorebirds, it is constantly changing. If we are to guide shorebird conservation into the future, we must learn how shorebirds respond to these changes. Beginning in 1990, PRBO, with partners, began the San Francisco Bay Shorebird Census to measure shorebird response to the changing San Francisco Bay. The most recent survey was conducted in November 2008.

On the 2008 survey, over **343,000 shorebirds** were counted throughout San Francisco Bay from November 13-15. The census was lead by the partner organizations (PRBO Conservation Science, Audubon California, San Francisco Bay Bird Observatory, U.S. Geologic Survey, and U.S. Fish and Wildlife Service) with help from many other agencies and organizations, and over 100 Bay Area citizen scientists. Counts were conducted during a high tide (>5 ft) when birds were forced off mudflats and were concentrated at roost sites allowing observers to more accurately count individuals. All known and potential roost sites were delineated and each site was counted by one or more experienced observers during 3-6 hours. Observers identified birds to species unless poor survey conditions (e.g., low fog or birds too far away) precluded accurate identification of all individuals. In these cases, observers estimated flock size, recorded which species were present and in what proportions.

Preliminary results indicate that the total number of shorebirds in 2008 was close to the average for the other 5 years (1990-92 and 2006-07). We present the totals for 22 species of shorebirds in 2006, 2007 and 2008 in Figure 1. These include all abundant to moderately abundant species and species of conservation concern or general interest to land managers or the public. Snowy Plover and Wilson's Snipe were excluded from this report because they are not adequately surveyed using our methods. The most abundant species in the Bay in 2008 was the Western Sandpiper (30% of total birds), followed by Dunlin (29%), Least Sandpiper (12%), American Avocet (8%), and Willet (6%). For many species, the number of individuals counted was remarkably similar over the last three years (Figure 1). For example, Western Sandpiper ranged from 102,005 to 103,179 individuals among the three years. When there were differences, the 2008 counts were generally lower than the previous two years. This difference was most noticeable in the Semipalmated Plover for

which we counted 3,267 in 2006, 1,970 in 2007, and only 1,485 in 2008. We also detected far fewer Red Knots this year (130) than the past two years (671 in 2006 and 637 in 2007; Figure 1).

Shorebirds were detected in all 10 Bay Regions (see map of Bay Regions, Figure 2) with the majority found along the western and northern portion of San Pablo Bay (Bay Region A) and in southern South San Francisco Bay (Bay Regions F and G). Habitat types in the western and northern portion of San Pablo Bay include extensive agricultural areas and undeveloped diked baylands, large expanses of tidal marsh, salt evaporation ponds, and former salt ponds under tidal restoration. The highest counts for Semipalmated Plover, Killdeer, American Avocet, Greater Yellowlegs, and Dunlin were found in this Bay Region (Figure 3). Bay Regions F and G are characterized by extensive tidal flats (used by shorebirds for feeding), and active salt ponds and salt ponds managed for wildlife that are used for both feeding and roosting. The highest counts for Black-bellied Plover, Black-necked Stilt, Willet, Lesser Yellowlegs, Long-billed Curlew, Marbled Godwit, Ruddy Turnstone, Red Knot, Western Sandpiper, Least Sandpiper, and dowitchers were from the F or G Bay Regions. The rocky shorelines and structures along the Central Bay (C and J) supported the highest counts of Black Oystercatchers, Spotted Sandpipers, Black Turnstones, Surfbirds and Sanderlings. Whimbrels seemed to favor roosting sites along western shores of South San Francisco Bay (I and H). While our results show that the extensive foraging and roosting habitats in the northern- and southern-most Bay Regions support large numbers of most species, other Bay Regions had the highest counts for other species. For example, the Central Bay had the highest roosting numbers of rocky-coast species. Our results demonstrate the importance of taking a Bay-wide approach to protect the populations of multiple species of shorebirds.

An initial comparison of the data from the 1990-92 and 2006-08 periods suggest some species including American Avocet appear to have increased while others such as Dunlin may have decreased. There also appear to be distributional shifts within the Bay with more shorebirds now using newly restored tidal wetlands in the northern portion of the Bay. We are in the process of synthesizing the results of all our censuses to determine how shorebird abundance and distribution has changed throughout the Bay over the years. We will also assess the effectiveness of our methods for detecting changes in abundance and distribution, and provide recommendations for improvement if warranted. Future surveys, when compared with our recent results, will shed light on how changes to the landscape (e.g., development, restoration, climate change) affect shorebird populations. We aim to publish our results and distribute them widely to help various agencies and environmental groups involved in land acquisition or stewardship make decisions based on sound science to keep the Bay a great place for birds.

#### Acknowledgements

The 2008 November shorebird survey of San Francisco Bay was a cooperative project of PRBO Conservation Science, San Francisco Bay Birds Observatory, Audubon California, U.S. Geological Survey, and U.S. Fish and Wildlife Service. We thank the many volunteers whose efforts made it possible to conduct such a large-scale census. Funding for this

project was provided through the San Francisco Bay Wetlands Program of the Resources Legacy Fund.

*Comprehensive surveys of the San Francisco Bay estuary, November 2006-08*



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Figure 1. Total numbers of 22 shorebird species detected on comprehensive surveys of the San Francisco Bay estuary, November 2006-08<sup>1</sup>. Species are presented in taxonomic order.

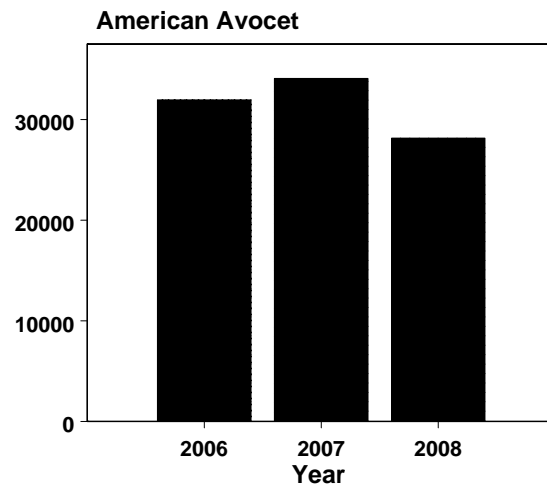
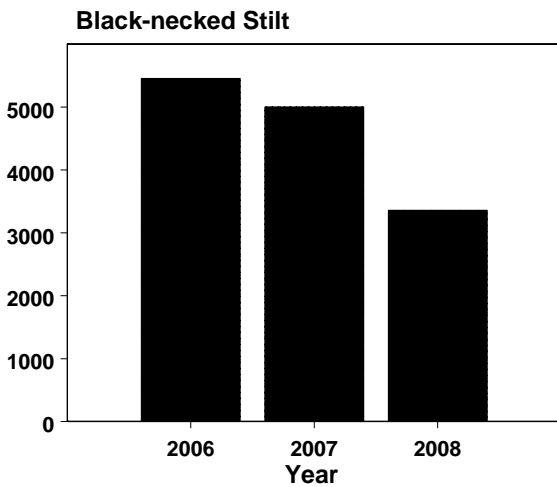
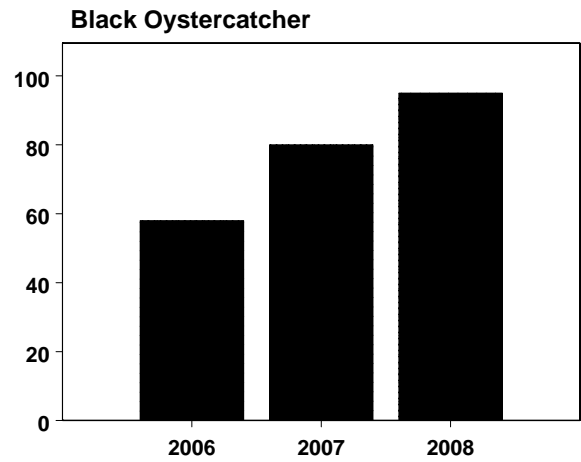
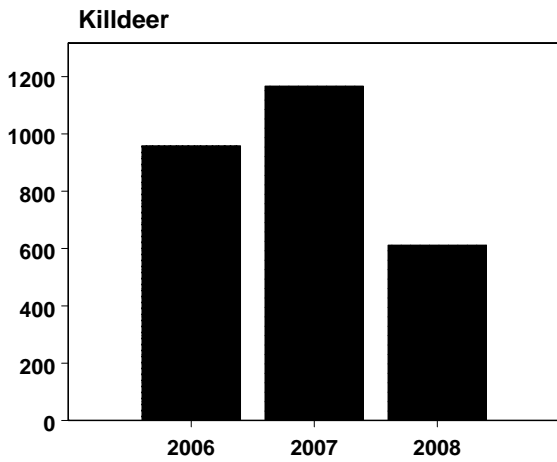
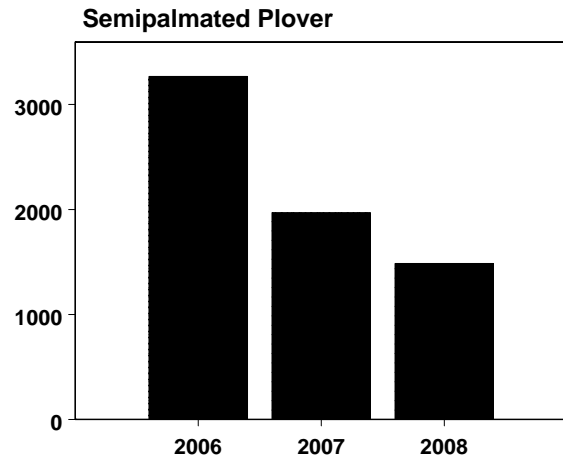
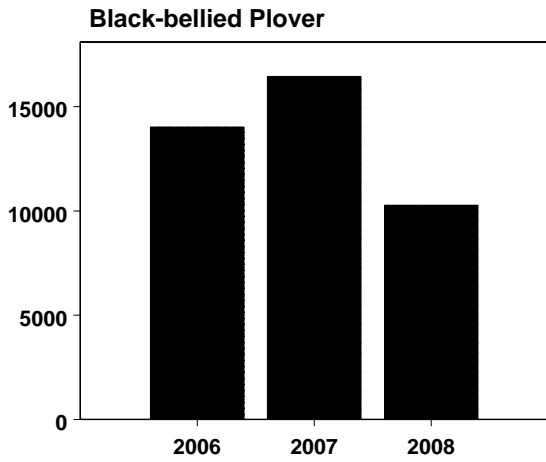
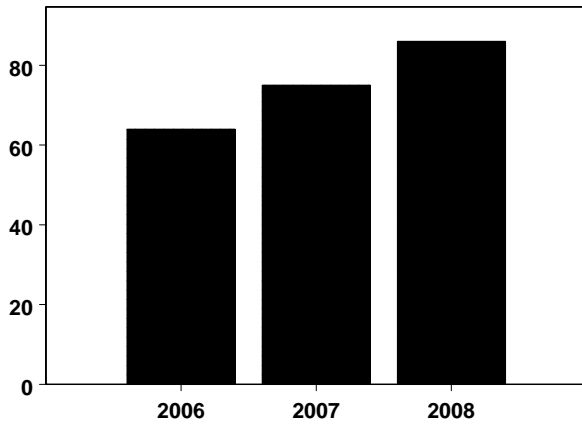
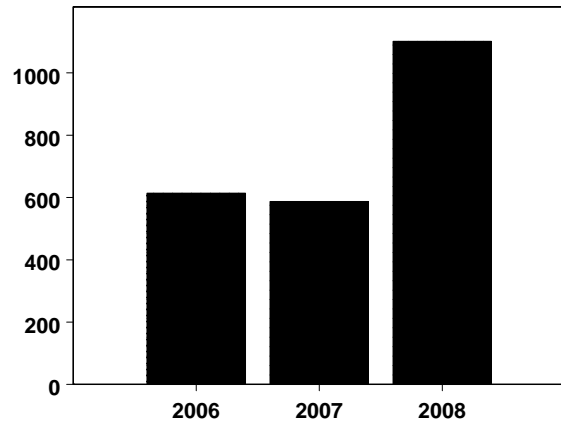


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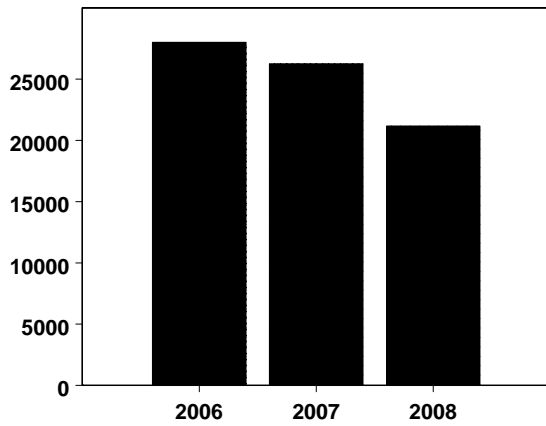
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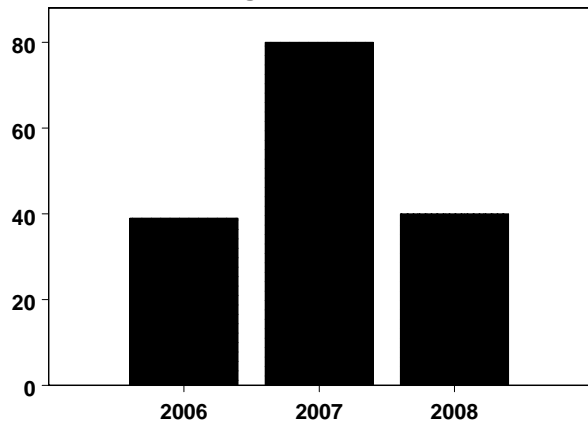
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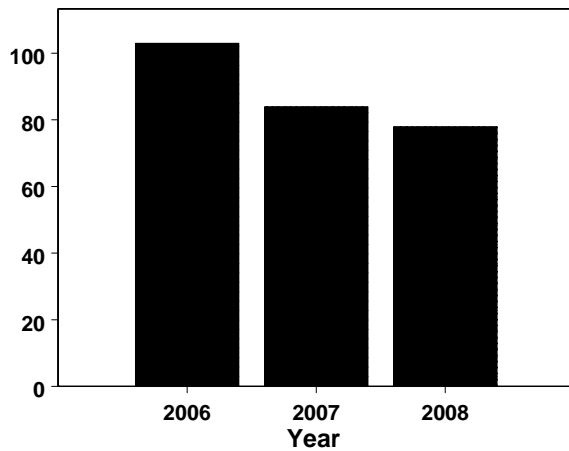
**Willet**



**Lesser Yellowlegs**



**Whimbrel**



**Long-billed Curlew**

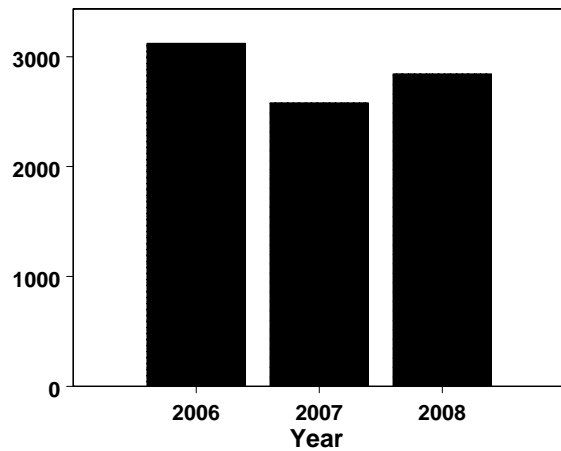


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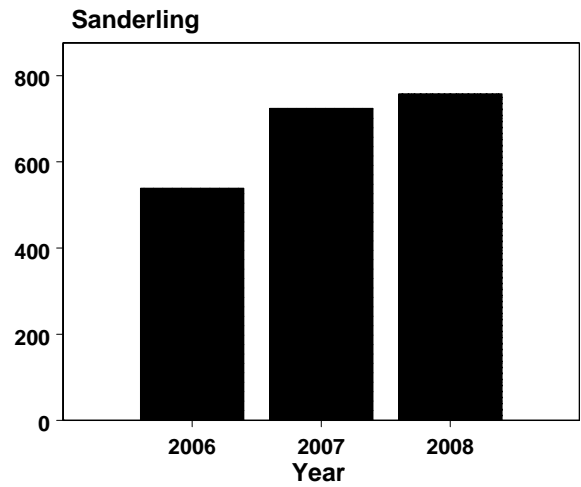
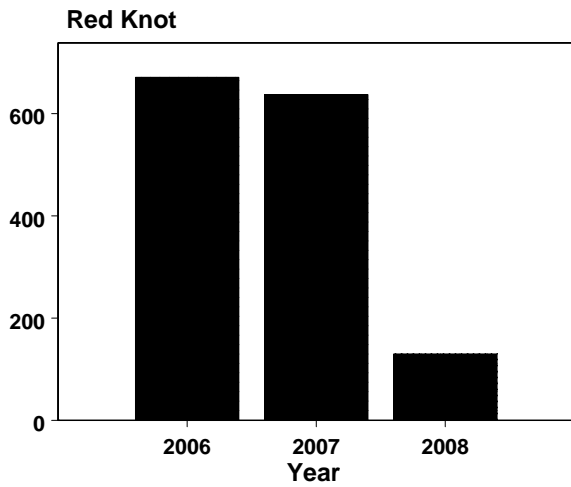
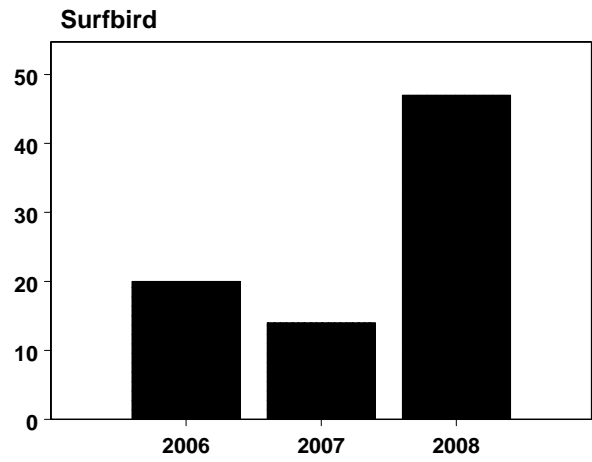
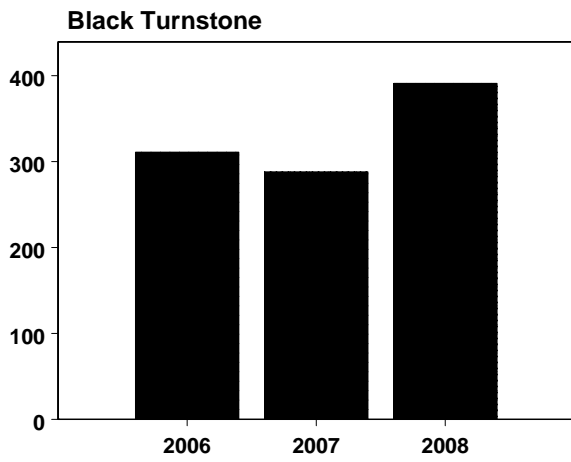
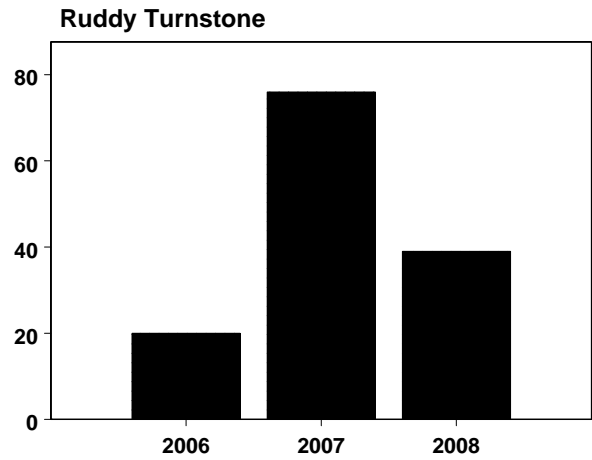
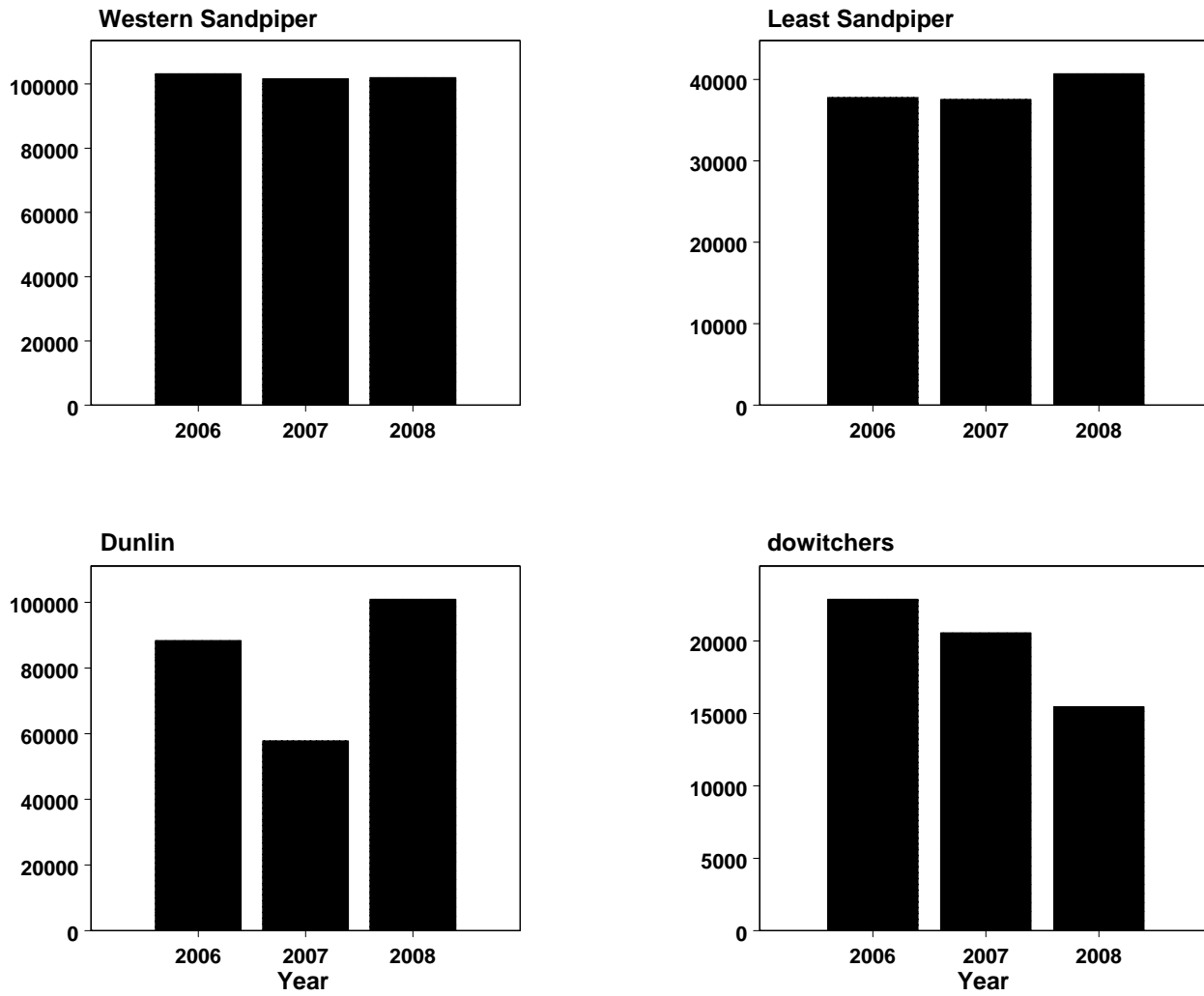


Figure I. Continued



<sup>1</sup> Surveys were conducted on November 6-7, 2006; November 8-10, 2007; and November 13-15, 2008

Figure 2. Map of San Francisco Bay shorebird census Bay Regions (A-J).

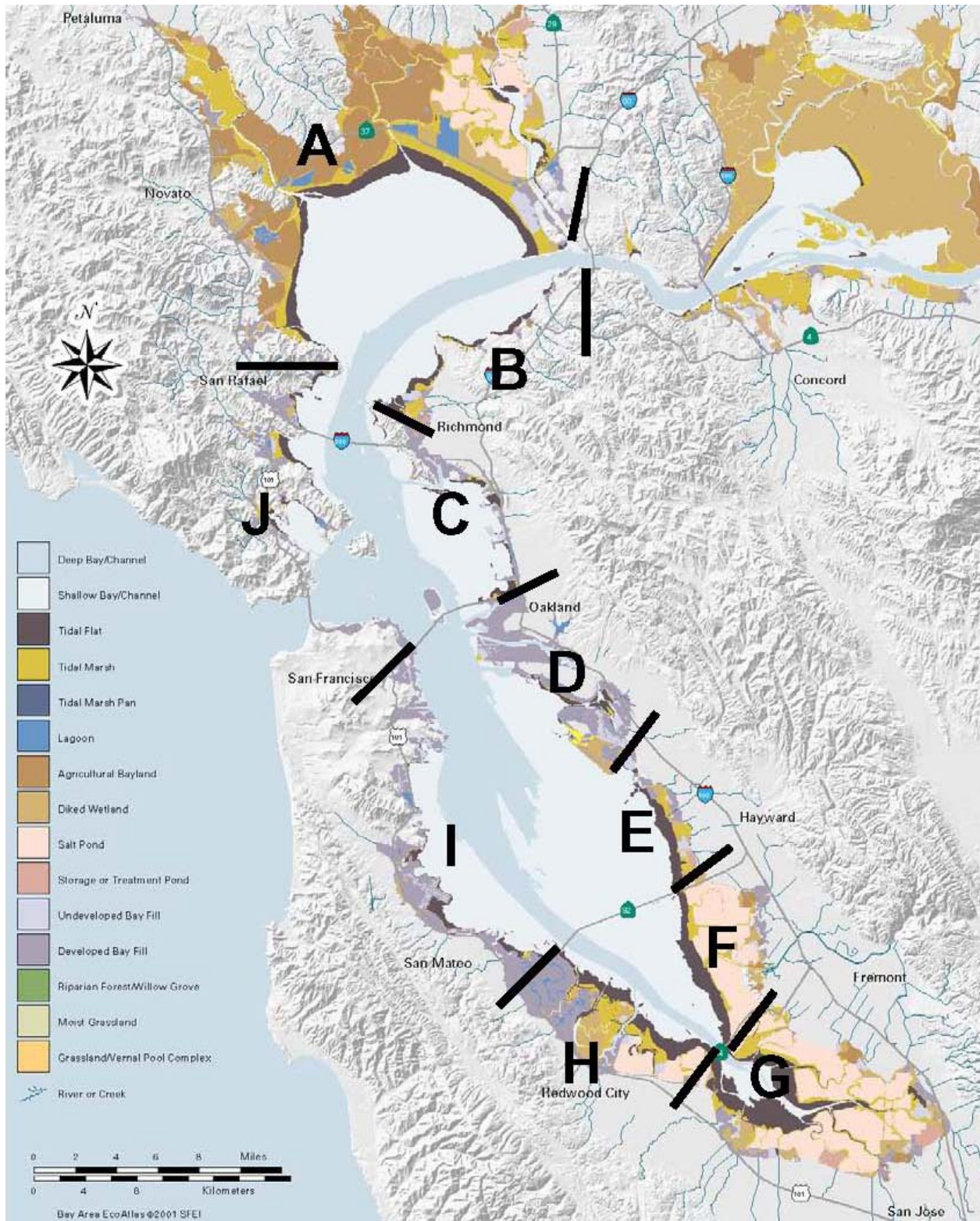


Figure 3. Total numbers of 22 species of shorebirds counted in eight Bay Regions (see Figure 2 map) of the San Francisco-San Pablo Bay estuary, November 2008. Species are presented in taxonomic order. Bay Regions C&J and D&E have similar in habitat and species composition and are shown together.

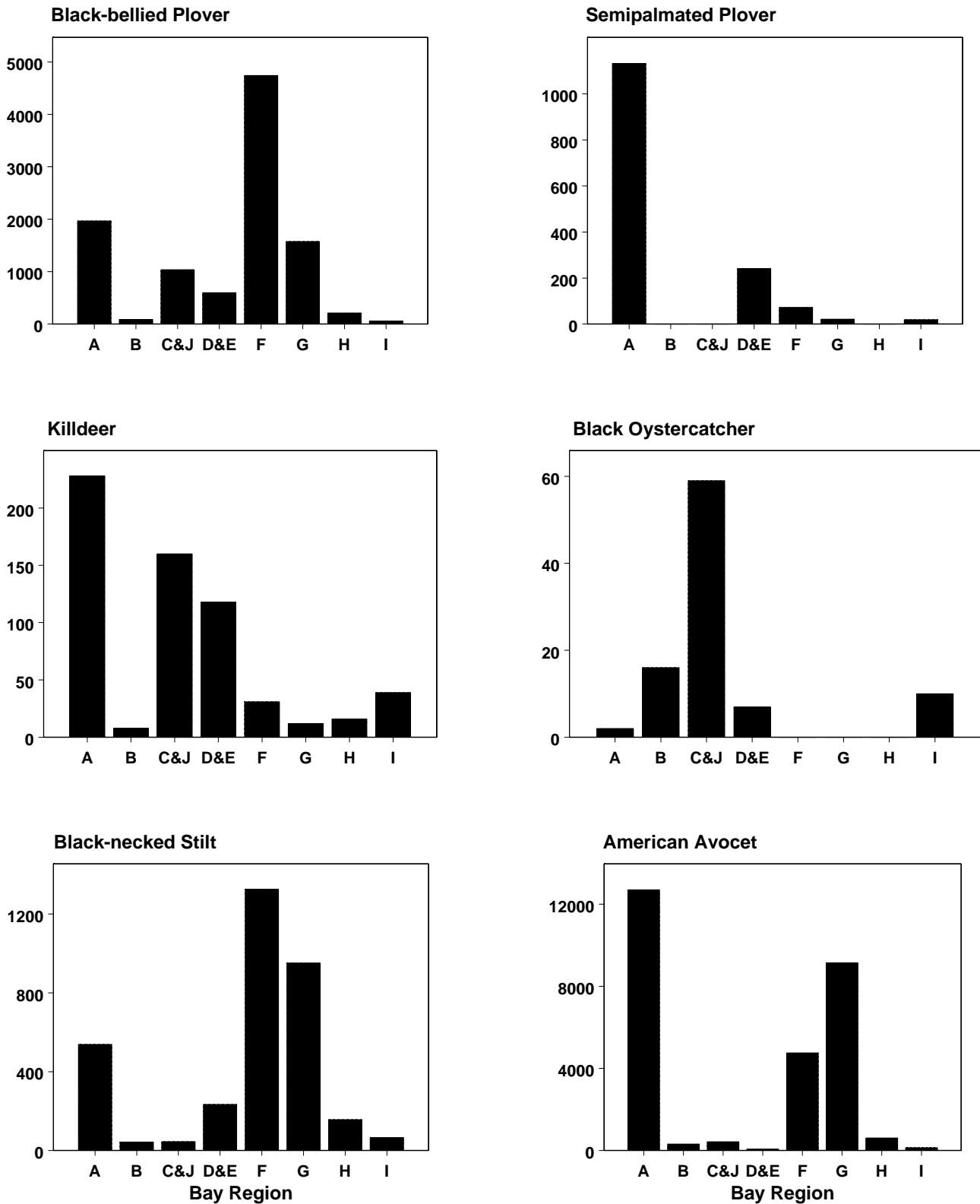
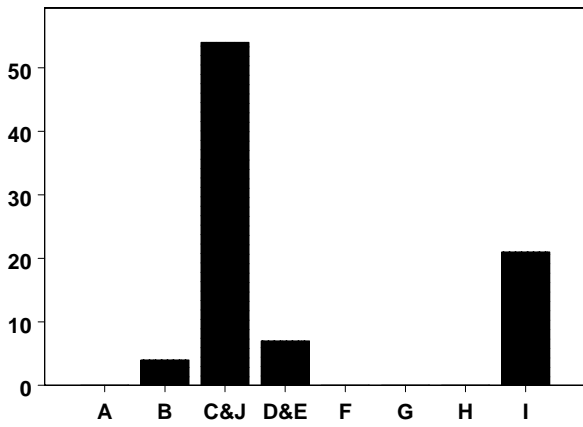
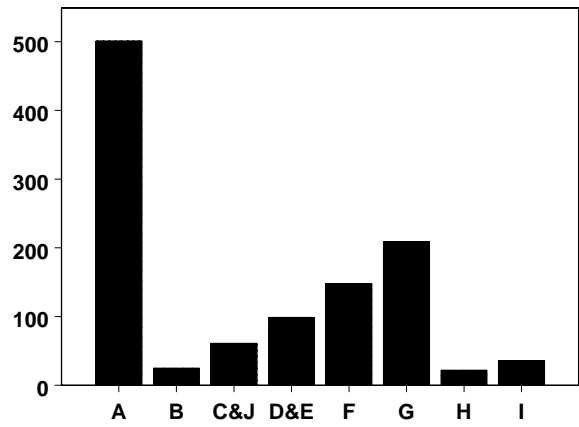


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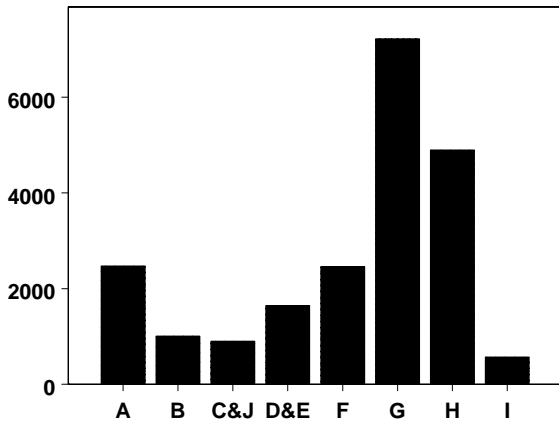
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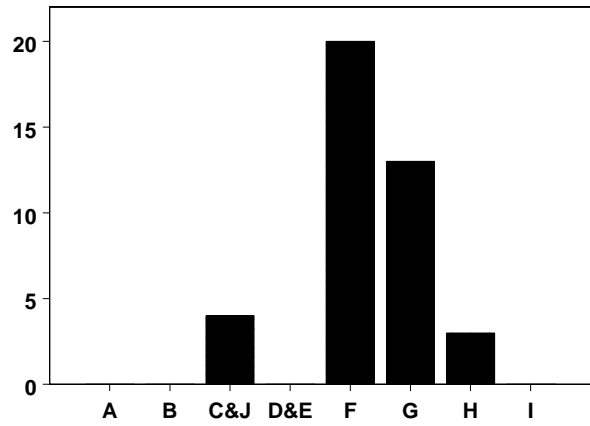
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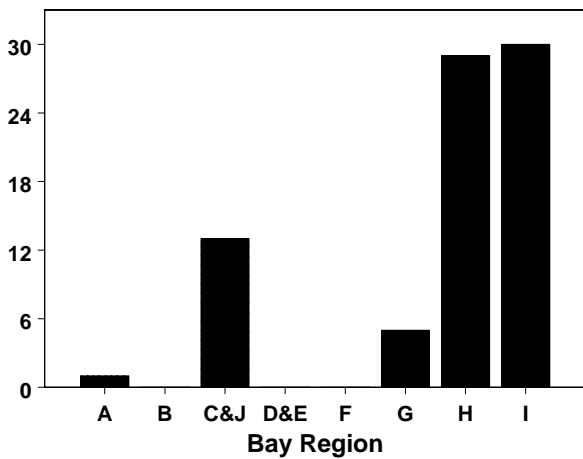
**Willet**



**Lesser Yellowlegs**



**Whimbrel**



**Long-billed Curlew**

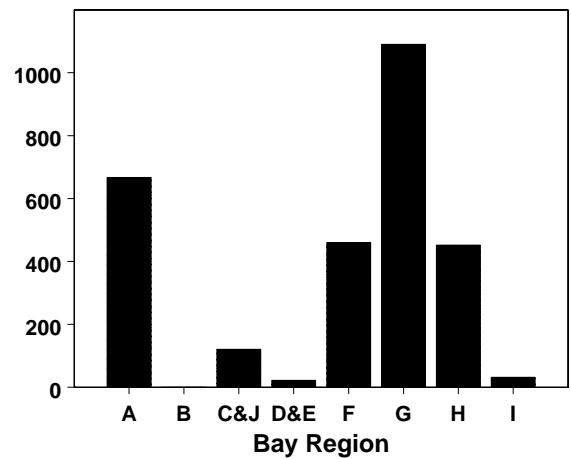


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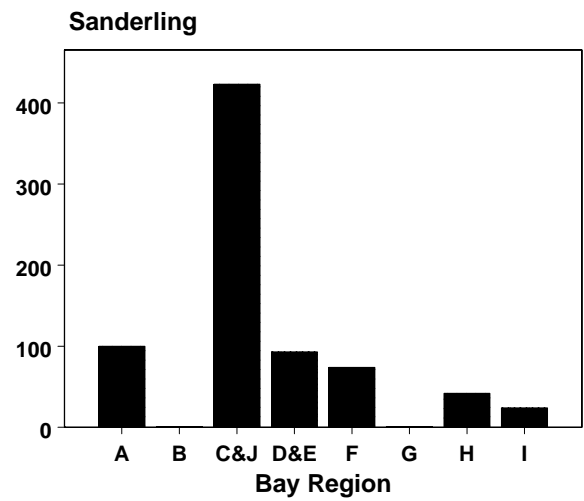
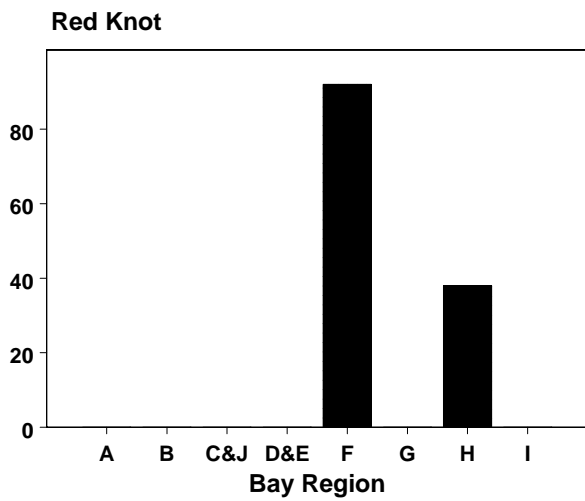
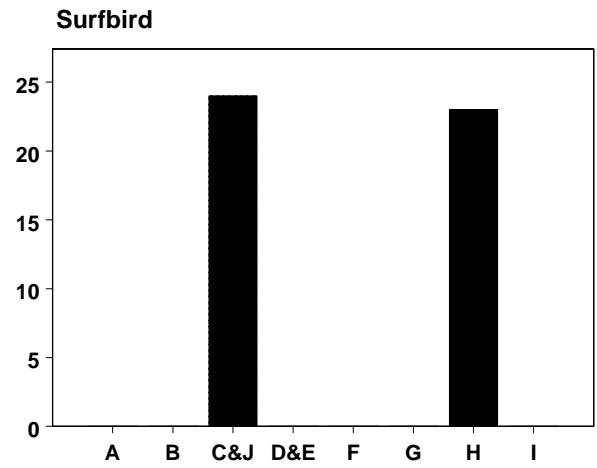
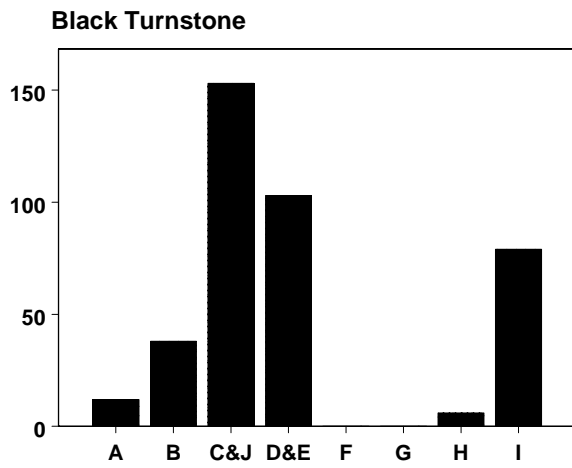
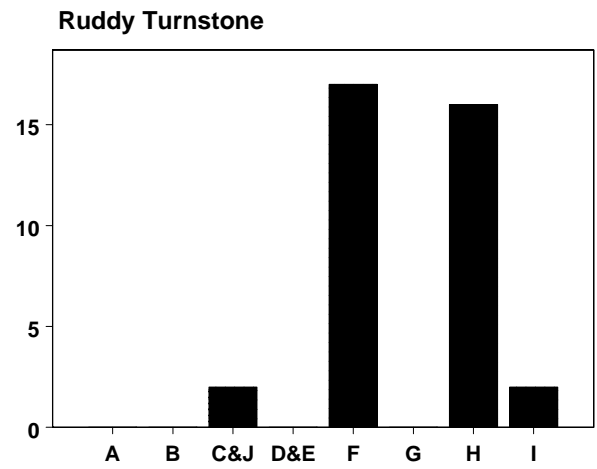
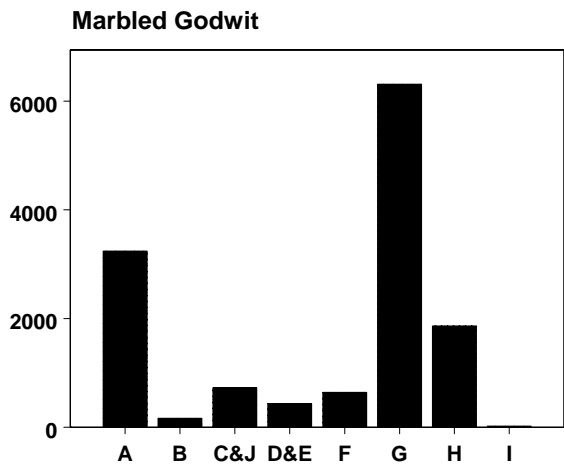


Figure 3. Continued.

