

Appendix 1. Estimates of sea duck abundance for open bay regions of San Francisco Bay based on counts conducted between 1988 and 2018. The Mid-winter waterfowl Survey (MWS) count from January 1990 winter count that can be attributed to each of the sub-regions of San Francisco Bay. The maximum of winter counts by sub-region are indicated with associated survey source, illustrating annual variability in counts that exceeded 10 birds per km² density, unadjusted for incomplete detection.

Species	Region	MWS 1990 ¹	Maximum Count
Scoters ⁴	Suisun Bay	3	6,098
	North Bay	17,613	17,613
	Central Bay	24,344	24,344
	South Bay	6,243	16,439
	All Open Bay Subtotals	48,203	
Bufflehead	Suisun Bay	111	379
	North Bay	141	1,092
	Central Bay	1,432	3,751
	South Bay	180	2,464
	All Open Bay Subtotals	1,864	
Goldeneyes ⁵	Suisun Bay	6	4,669
	North Bay	341	341
	Central Bay	199	351
	South Bay	3	117
	All Open Bay Subtotals	549	
TOTAL	San Francisco Bay	50,616	

1 = Winter count values from Accurso (1992).

2 = Winter count values from Orien et al. (2014)

3 = Winter count values from Strong (2018).

a = Scoters are assumed to be predominantly Surf Scoter, however no rigorous assessment has quantified this ratio

b = Goldeneyes are assumed to be predominantly Common Goldeneye, however no rigorous assessment has quantified this ratio

Comparative winter surveys
1990 is the highest single-
observed species-specific
value. **Bolded** values indicate

Count Source

MWS 1989¹

MWS 1990¹

MWS 1990¹

MWS 1988¹

MWS 2012²

MWS 2012²

MWS 2012²

MWS 2012²

MWS 2018³

MWS 1990¹

MWS 2012²

MWS 2012²

MWS 1990¹

relationship.

Identified this relationship.