



SAN FRANCISCO BAY  
BIRD OBSERVATORY



# Migration timing and spatial distribution of phalaropes in South San Francisco Bay

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## Background

- The South Bay Salt Pond Restoration Project (SBSPRP) is restoring former salt evaporation ponds to a mix of tidal marsh habitat and managed ponds to improve wildlife habitat, flood risk management, and public access.
- Phalaropes primarily use high salinity ponds in San Francisco Bay for foraging and roosting during migration, so tidal marsh restoration and conversion of ponds to low salinity for other wildlife may negatively impact phalarope use if other preferred habitats are unavailable in San Francisco Bay.
- *Objectives:* Define the seasonal timing and space use of migratory phalaropes in South San Francisco Bay to make recommendations for monitoring protocols, and determine multi-year trends in phalarope counts.

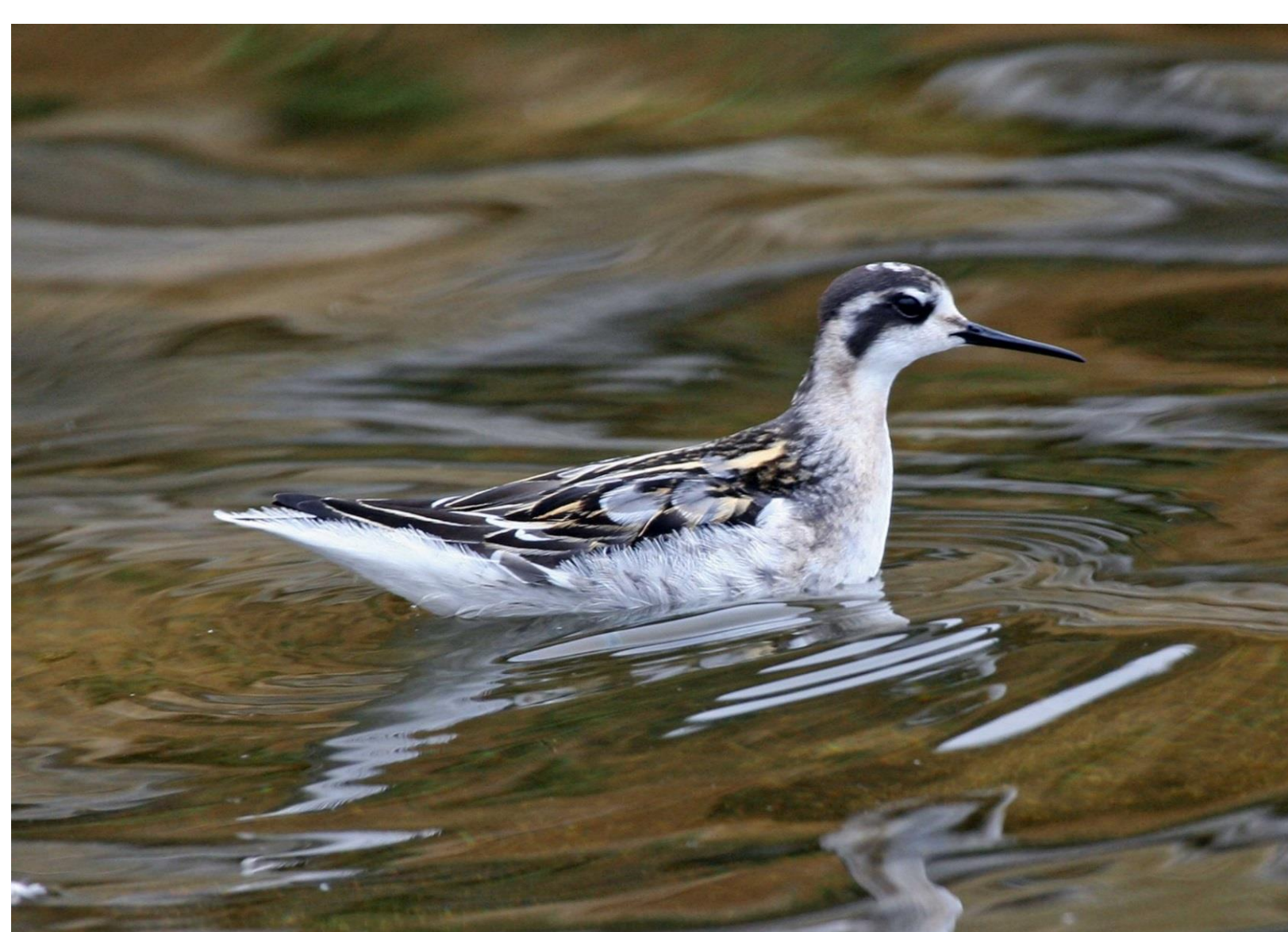


Fig 1 (left). Red-necked phalarope in winter plumage. Photo by Alvaro Jaramillo.

## Methods

- SBSPRP dataset: Surveys by the San Francisco Bay Bird Observatory and U.S. Geological Survey at 82 sites (60 SBSPRP ponds and 22 salt production ponds) yielded counts of Red-necked (n=470) and Wilson's Phalarope (n=95) from 2002–2019.
- eBird dataset: Downloaded the basic eBird dataset (Sullivan et al. 2009) and selected sightings for Red-necked (n=921) and Wilson's Phalarope (n=681) from Jan 2004–May 2019.

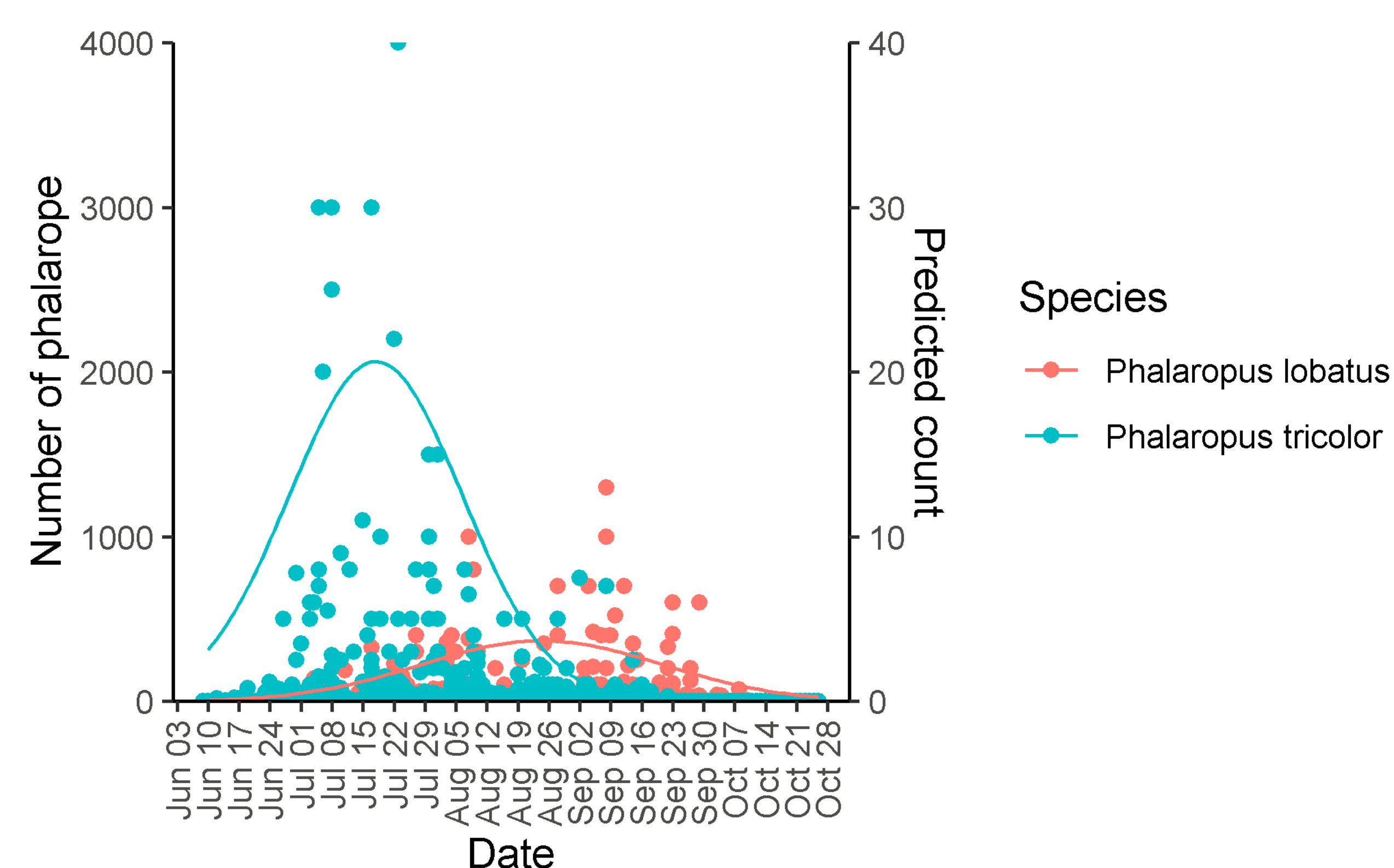
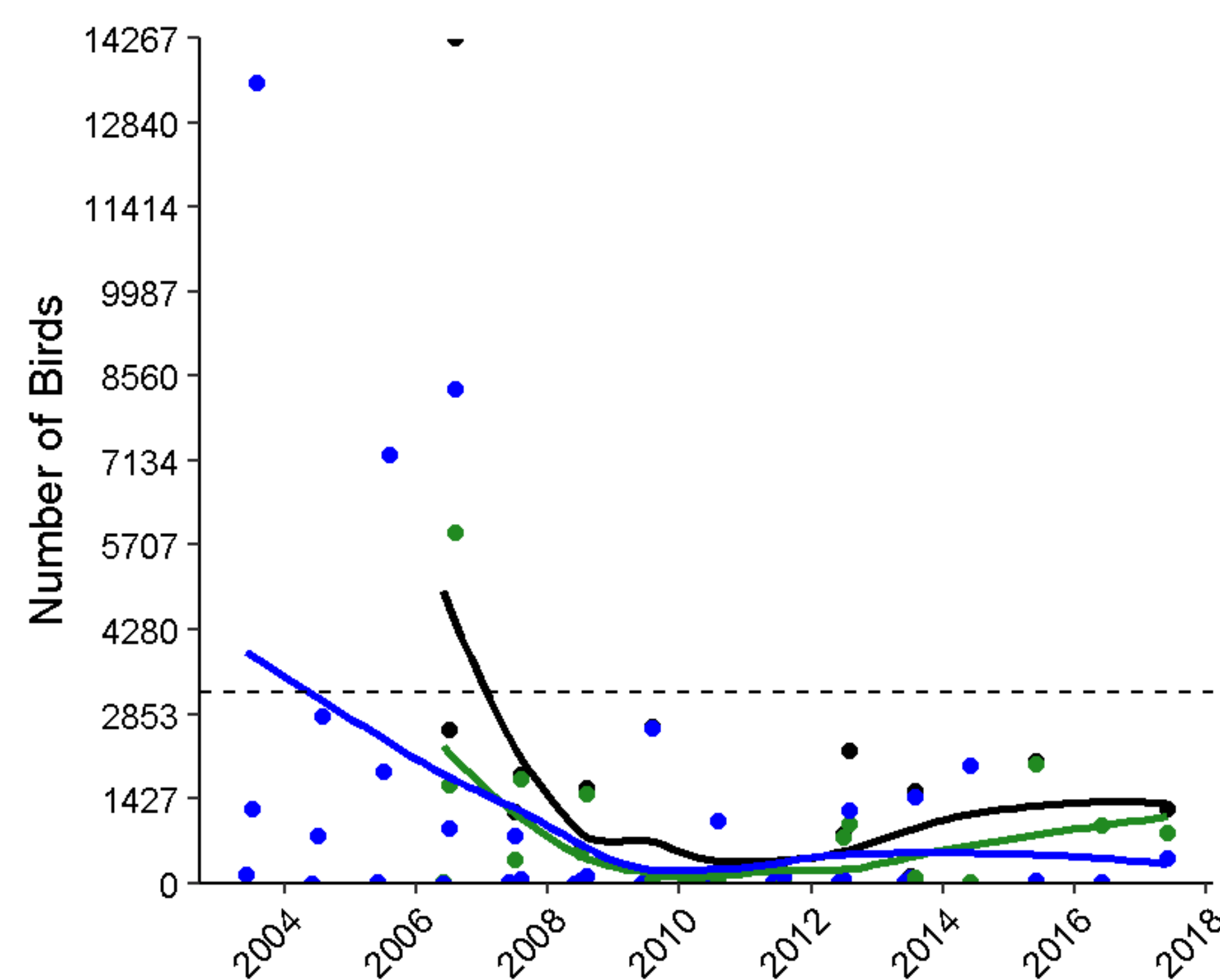


Fig 2 (above). Site-level summer counts of Red-necked Phalaropes (*Phalaropus lobatus*) and Wilson's Phalaropes (*P. tricolor*) in South San Francisco Bay from Jan 2005–May 2019. Fit curves identify the date of peak counts for each species. Counts from both data sources are shown.



Pond area  
— All  
— Salt ponds  
— SBSPRP

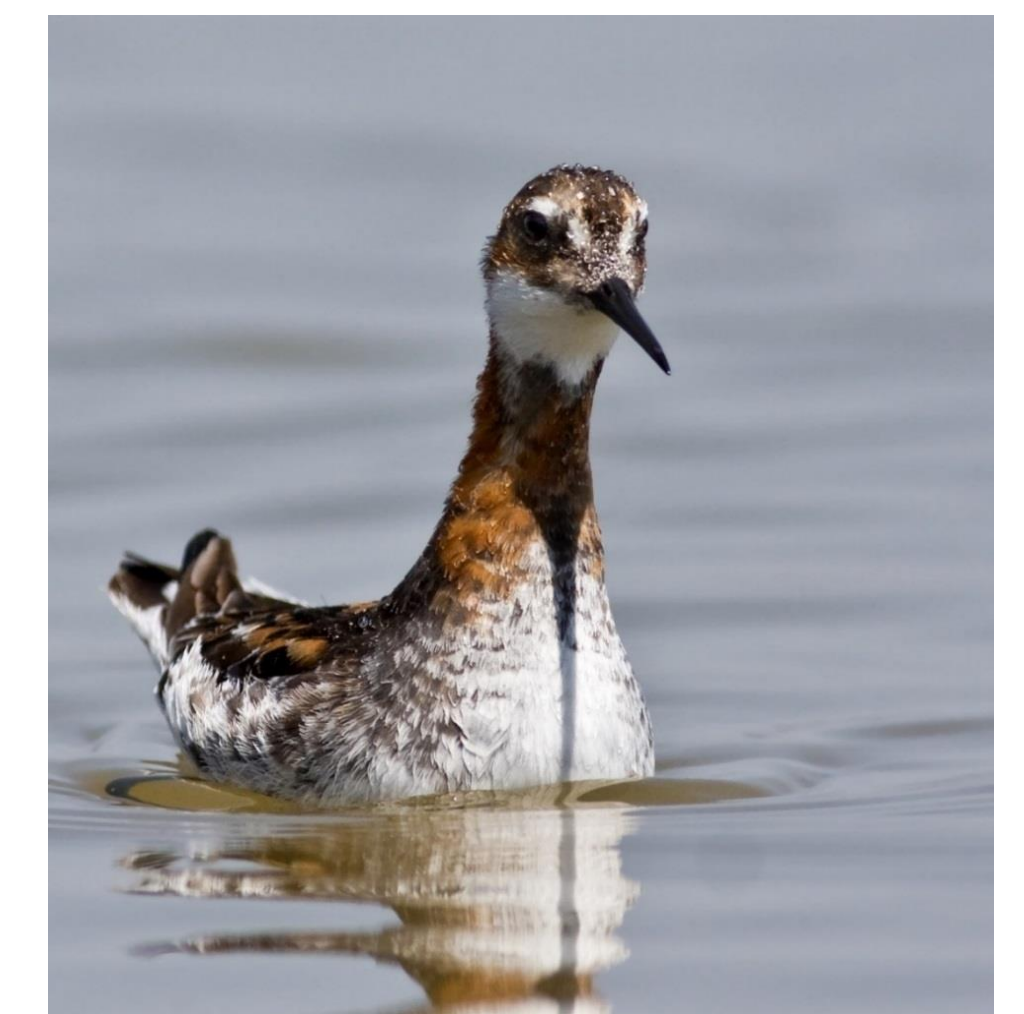


Fig 3 (left). SBSPRP counts of phalaropes in summer. Lines represent LOESS curves and the dashed line denotes the SBSPRP 2005–2007 average. Fig 4 (above). Red-necked phalarope in breeding plumage. Photo by Ken Phenicie.

## Results

- Wilson's Phalarope observations clustered in late summer and peaked on July 17; Red-necked Phalarope showed one peak in spring and were present in late summer to early fall, with a peak on August 24.
- 30 of the 82 SBSPRP and salt production sites encompass 95% of the observed phalaropes. eBird observations showed high counts at 4 additional sites
- Phalarope summer counts in SBSPRP ponds have declined by 66% compared to 2005–2007 counts, but counts were likely too infrequent and poorly timed to consistently capture peak migration.

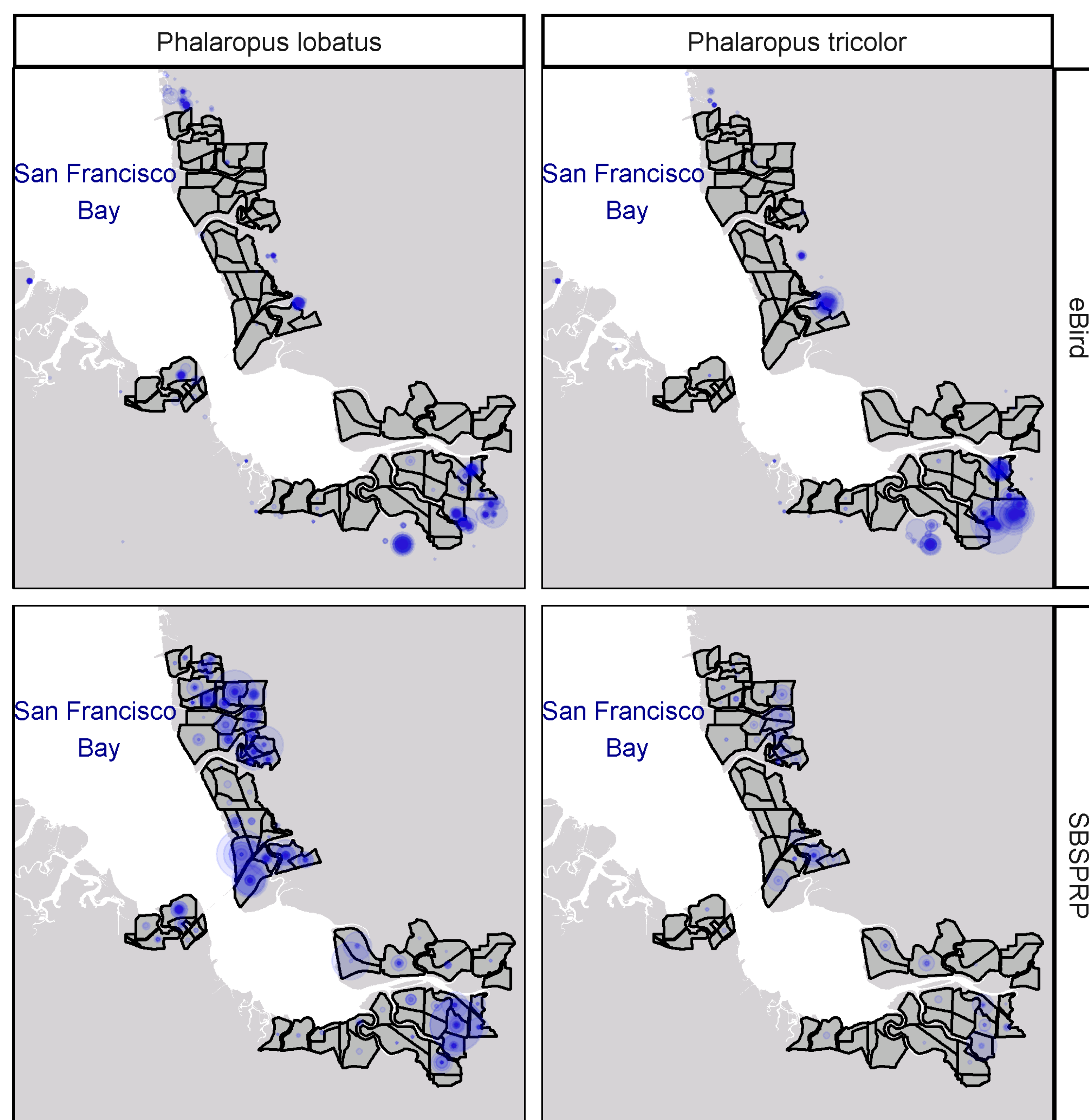


Fig 4 (left). Locations of phalarope sightings 2005–2019. Ponds outlined in black. Dot size = abundance for one observation. Blue intensity = number of observations.

Abundance  
● 1000  
● 2000  
● 3000  
● 4000  
● 5000

## Research & Monitoring Recommendations

- Capturing the peak migration for the two common phalarope species in San Francisco Bay requires conducting two sets of surveys, one near July 17 for Wilson's Phalarope and one near August 24 for Red-necked Phalarope.
- Surveys of 30 sites are likely to capture 95% of phalaropes on SBSPRP ponds. eBird sightings suggest adding 4 sites outside the SBSPRP footprint to surveys.
- Further analyses are needed to confirm the decline of phalaropes in the SBSPRP area and to determine whether the change is a result of project activities.

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