Waterbird Migration Surveys

SAN FRANCISCO BAY
BIRD OBSERVATORY

Gabbie Burns

Science Director of Waterbird Programs

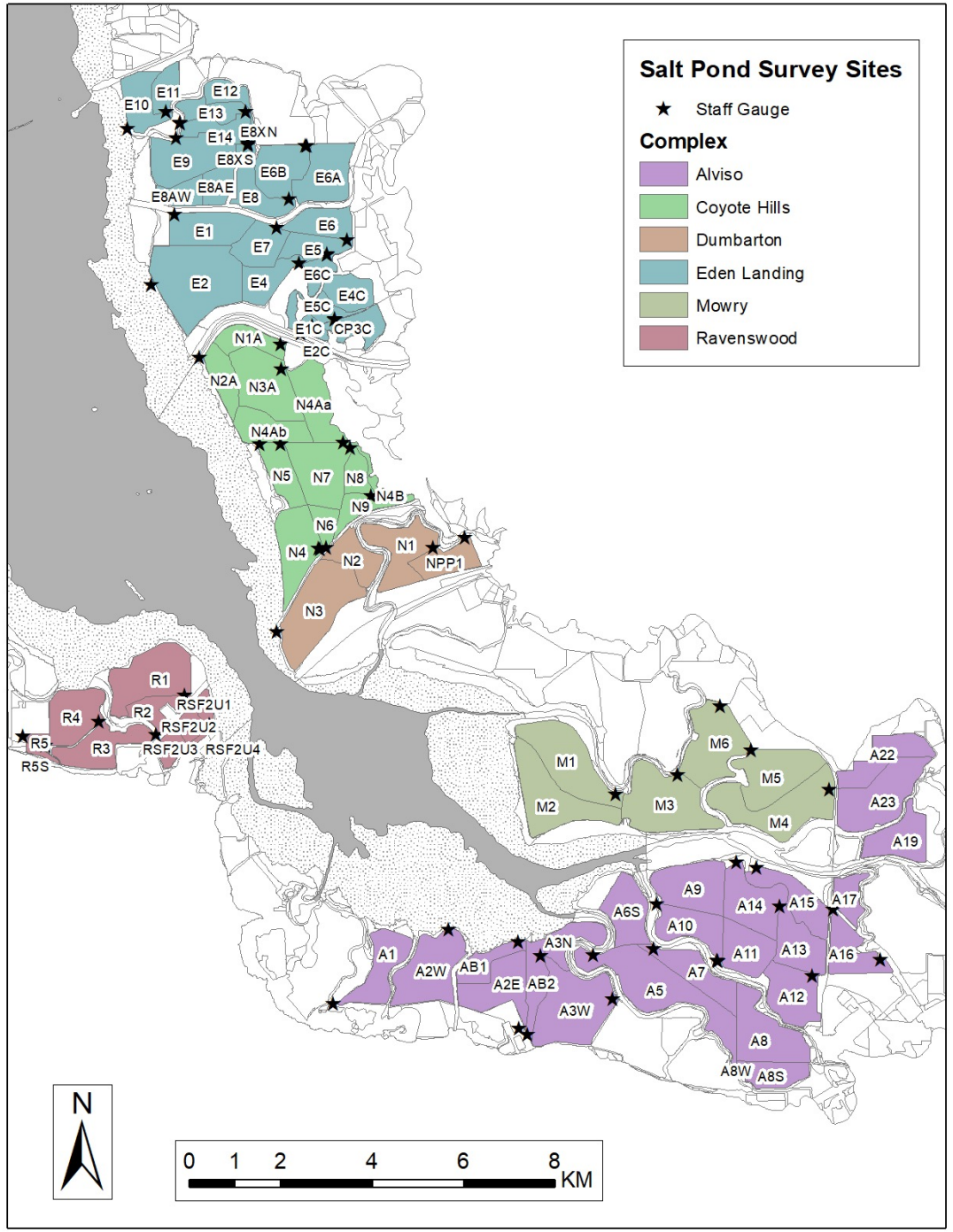
San Francisco Bay Bird Observatory

Adaptive Management Goals

- Goal: Restore 50-90% of ponds to tidal marsh while still maintaining enough habitat to support migratory waterbirds

Current Methodology

- 82 ponds
- 6-week survey rounds
  - 2x each fall, winter, spring
- High tide (> 4ft)
- Record:
  - Total count of waterbird species
  - Behavior
  - Water quality



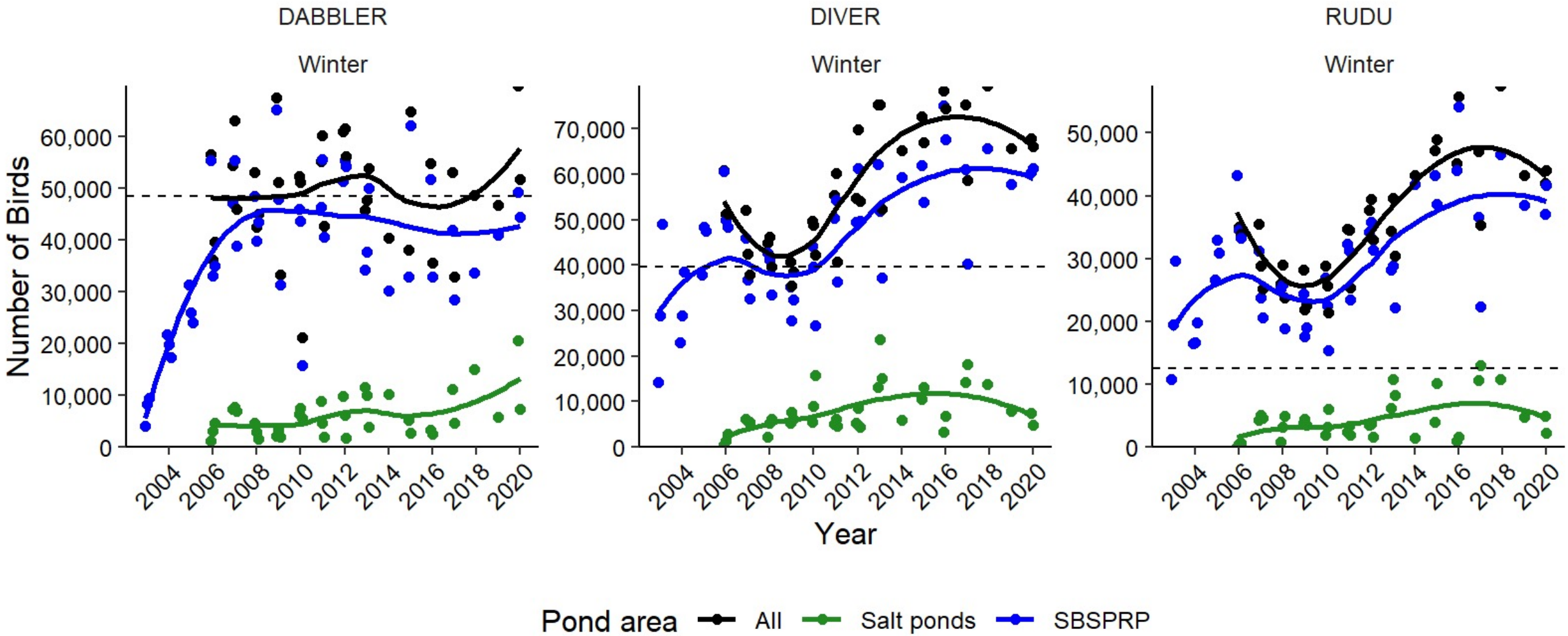
Targets, Thresholds, Triggers

- Target = baseline numbers from pre-restoration (2005-07)
- Threshold = percent decline below the baseline
- Trigger = counts below baseline over consecutive years

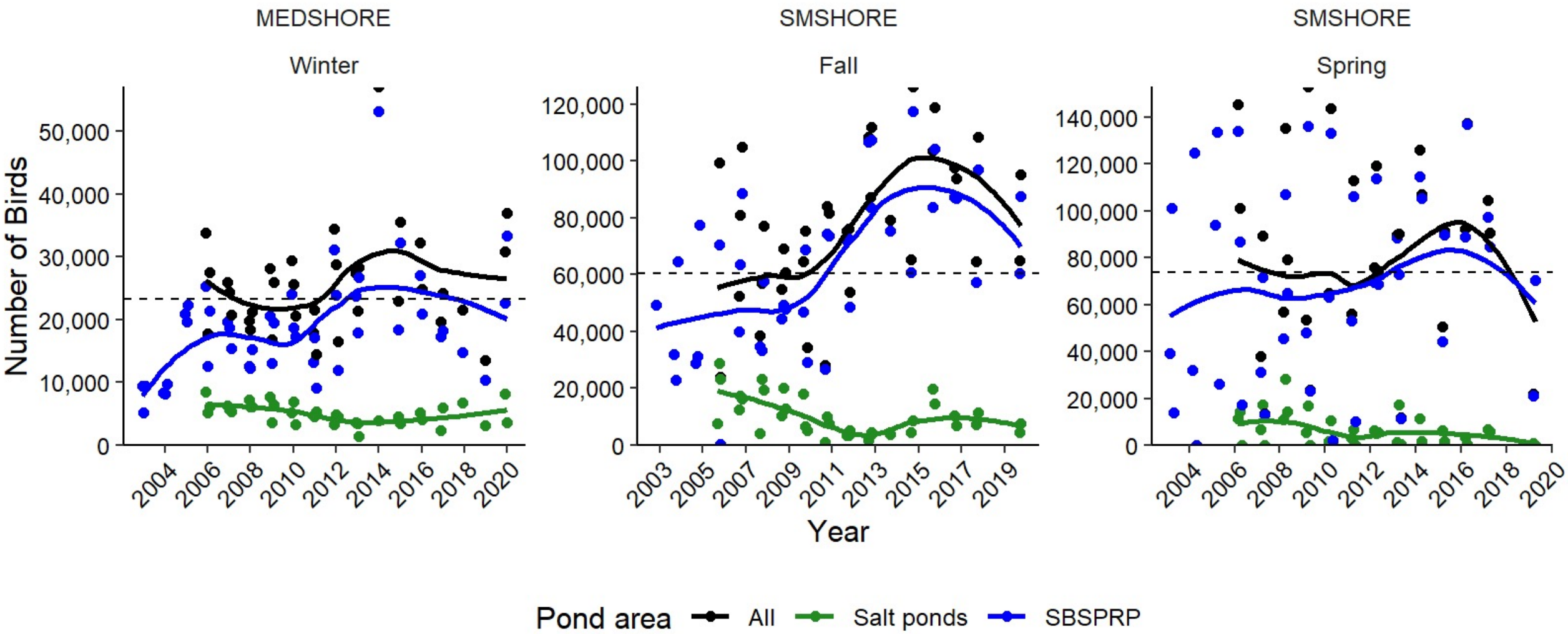
Targets, Thresholds, Triggers

Species/ Guild	NEPA/CEQA Baseline (Target)	SBSPRP Adaptive Management Trigger	NEPA/CEQA Significance Threshold
Ruddy Duck (RUDU)	12602 (2005-2007 mid-winter survey mean); range: 10722 (2007)-15575 (2005)	two years of decline in numbers below baseline conditions in South Bay as a whole out of any consecutive three years	decline in South Bay numbers of 15 percent as a result of the SBSP Restoration Project
Diving Ducks (excludes RUDU)	27043 (mid-winter survey average 2005-2007); range: 19521 (2007)-40326 (2005)	two years of decline in numbers below baseline conditions in South Bay as a whole out of any consecutive three years	decline in South Bay numbers of 20 percent as a result of the SBSP Restoration Project
Small Shorebirds - Winter/Fall	60623 (fall; 2005-2007 USGS/SFBBO mean); range 130662 (2005) to 241546 (2006)	two out of three consecutive years when the South Bay shorebird abundances fall below the baseline in any given season	decline in South Bay numbers of 20 percent as a result of the SBSP Restoration Project

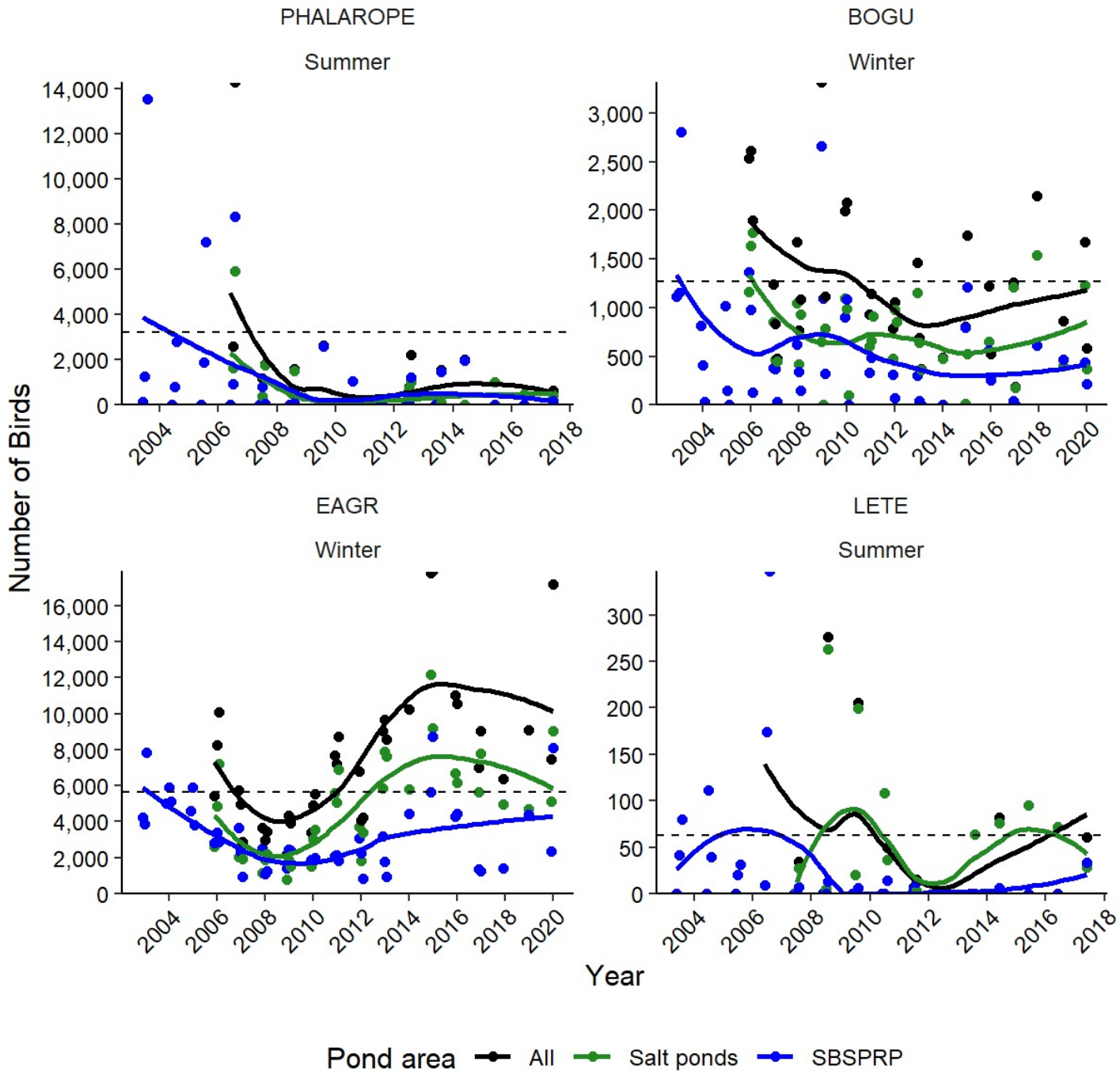
Trends


DABBLER
Winter
DIVER
Winter
RUDU
Winter
Number of Birds
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
2004
2006
2008
2010
2012
2014
2016
2018
2020
Year
Pond area
All
Salt ponds
SBSPRP

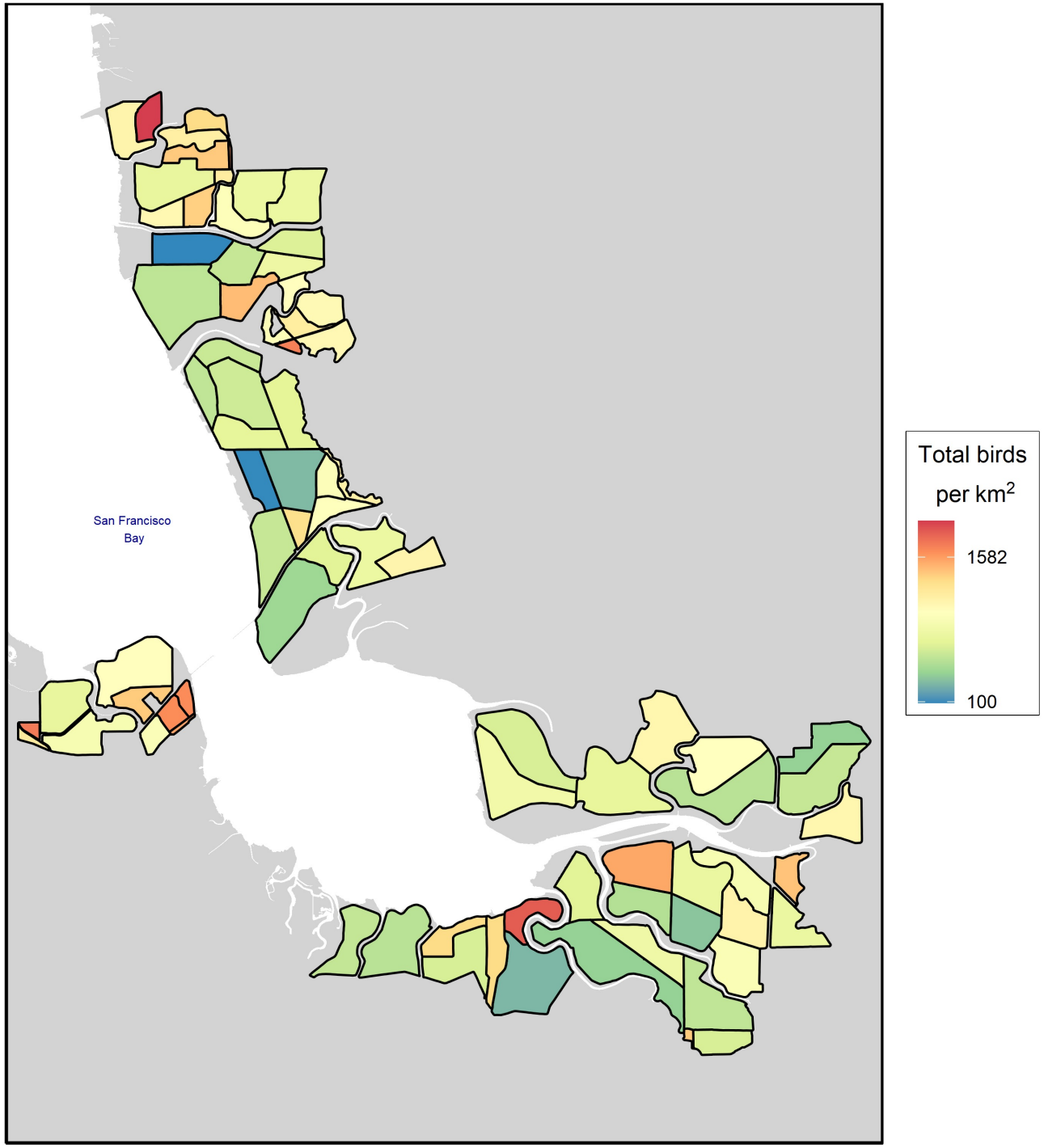
Trends

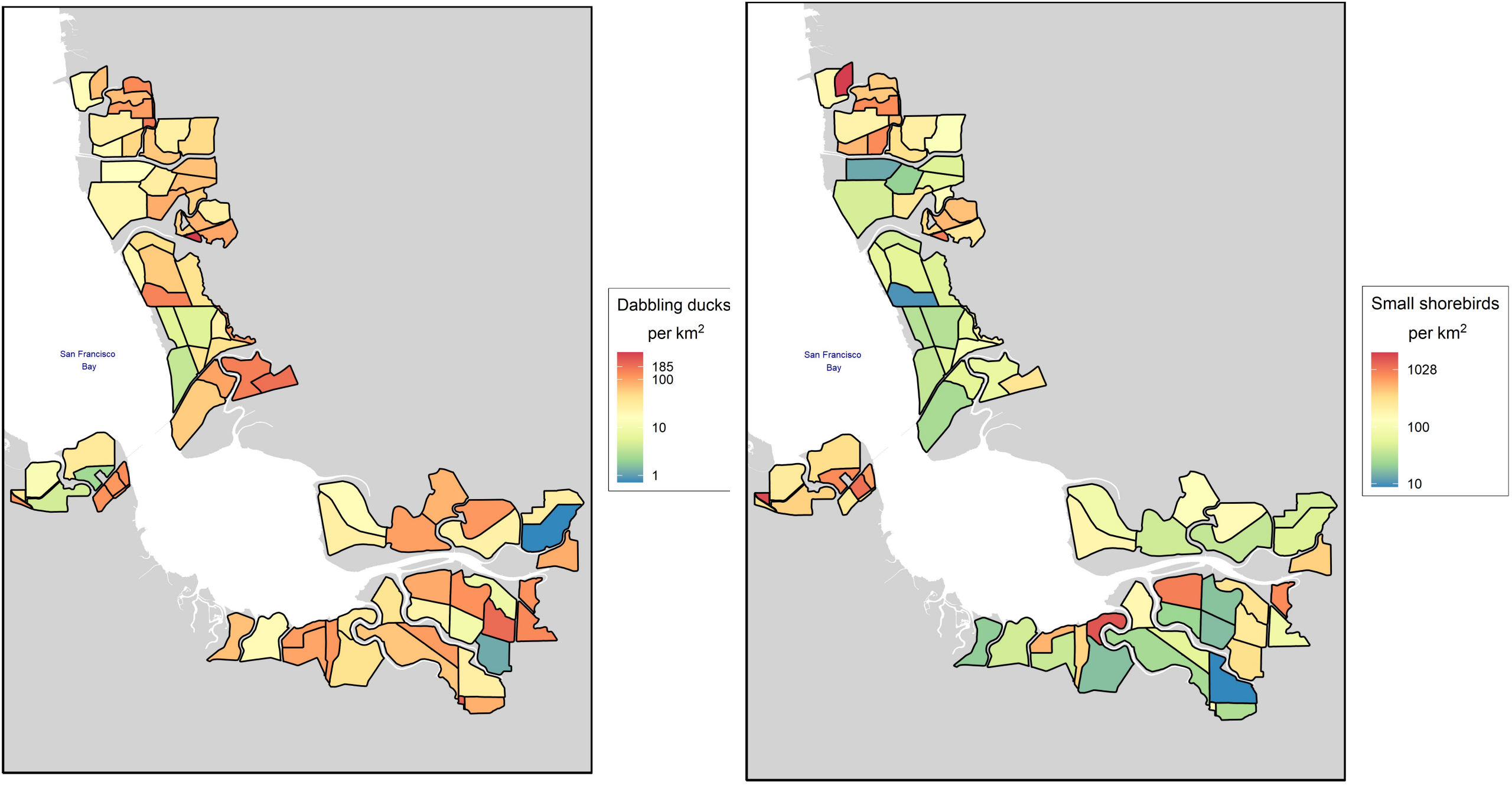

MEDSHORE
Winter
SMSHORE
Fall
SMSHORE
Spring
Number of Birds
Year
Pond area
All
Salt ponds
SBSPRP

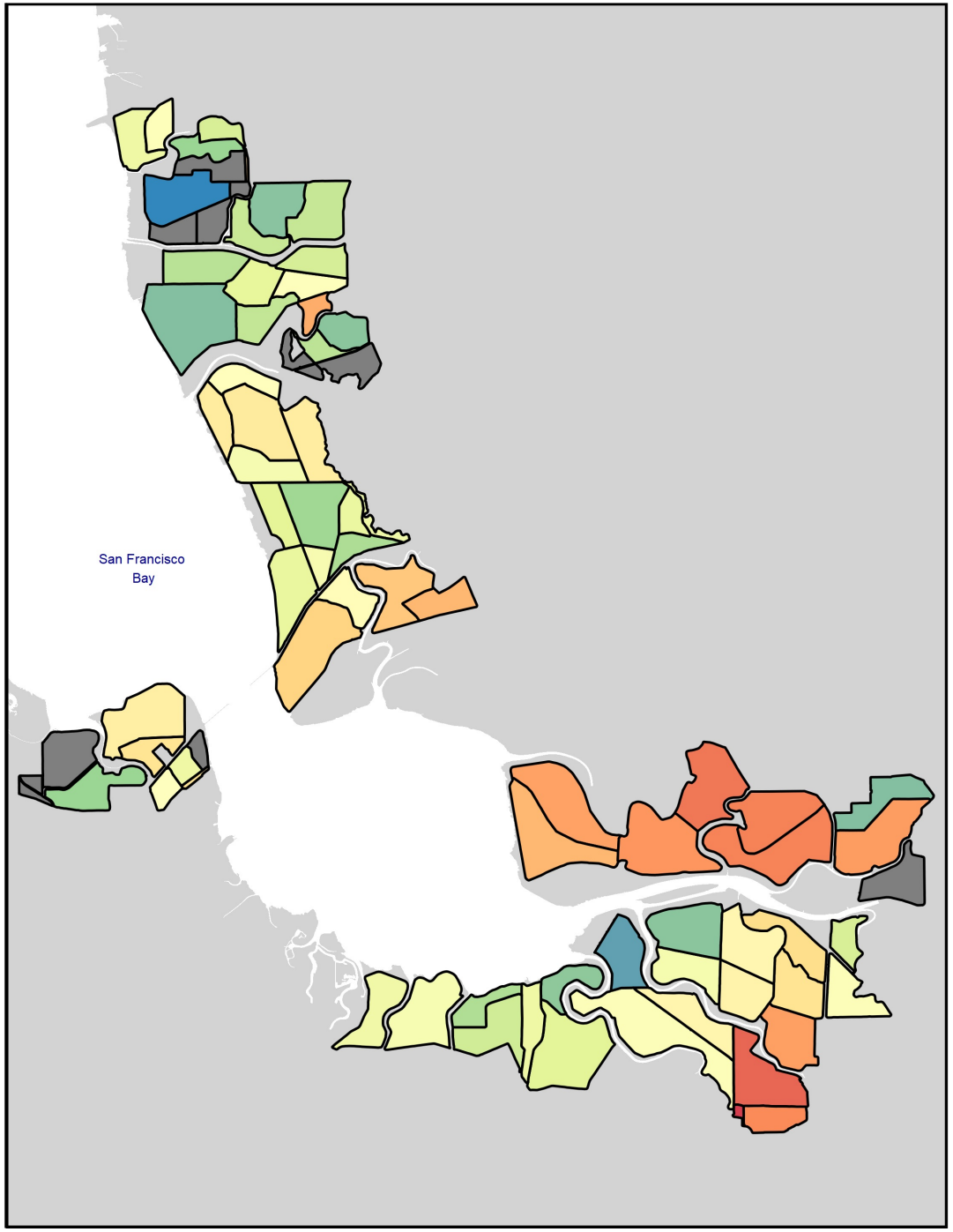
Trends


PHALAROPE
Summer
BOGU
Winter
EAGR
Winter
LETE
Summer
Number of Birds
Year
Pond area
All
Salt ponds
SBSPRP

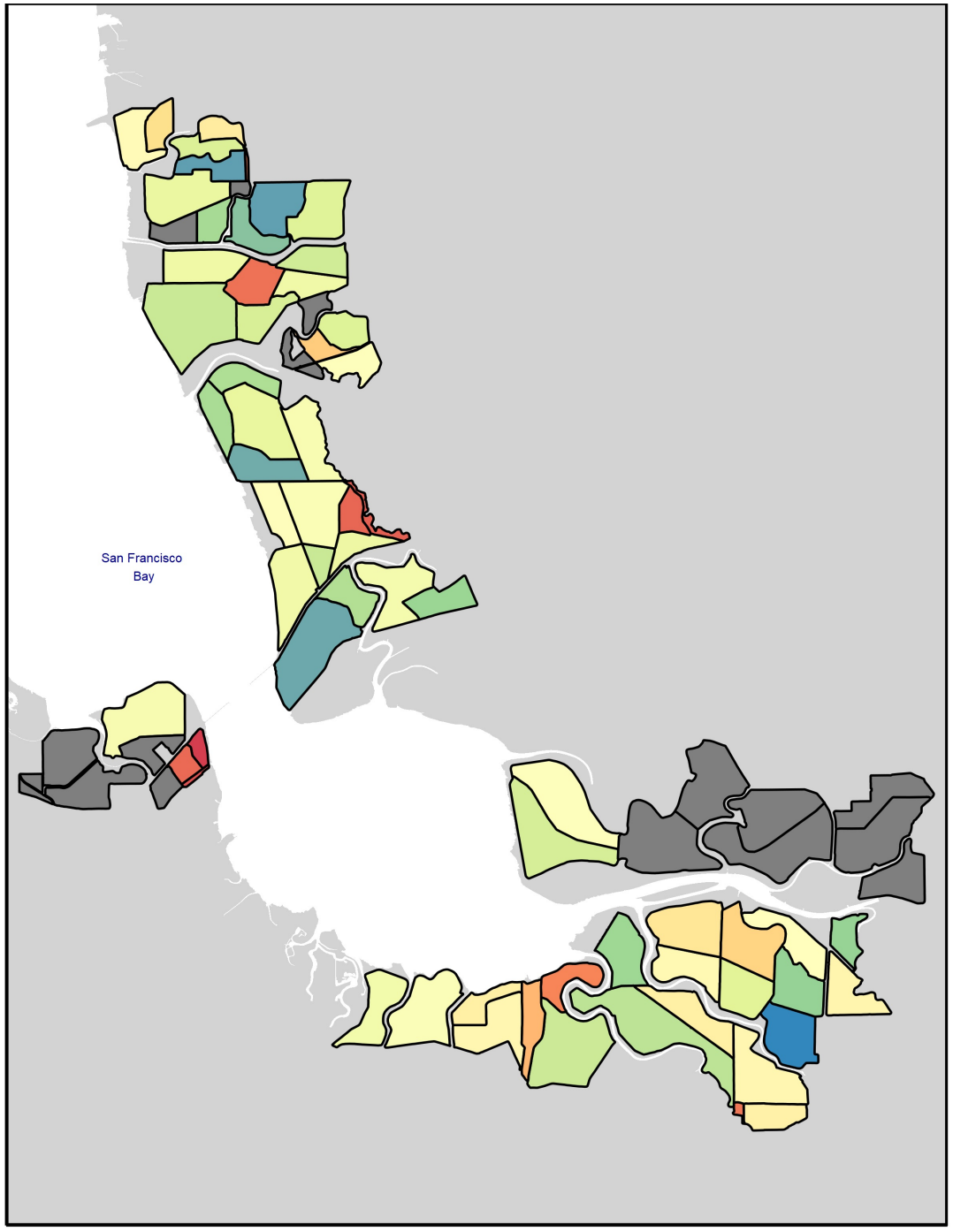
Pond Usage




San Francisco
Bay
Dabbling ducks
per km2
185
100
10
1
San Francisco
Bay
Small shorebirds
per km2
1028
100
10



Eared grebes
per km^2
980
10
1



Terns
per km^2
100
54
10

What’s Comes Next?

- Continued monitoring
- Adapt to Phase 2 changes
- Predictive modeling

Phalarope Migration Surveys

SAN FRANCISCO BAY
BIRD OBSERVATORY

Gabbie Burns

Science Director of Waterbird Programs

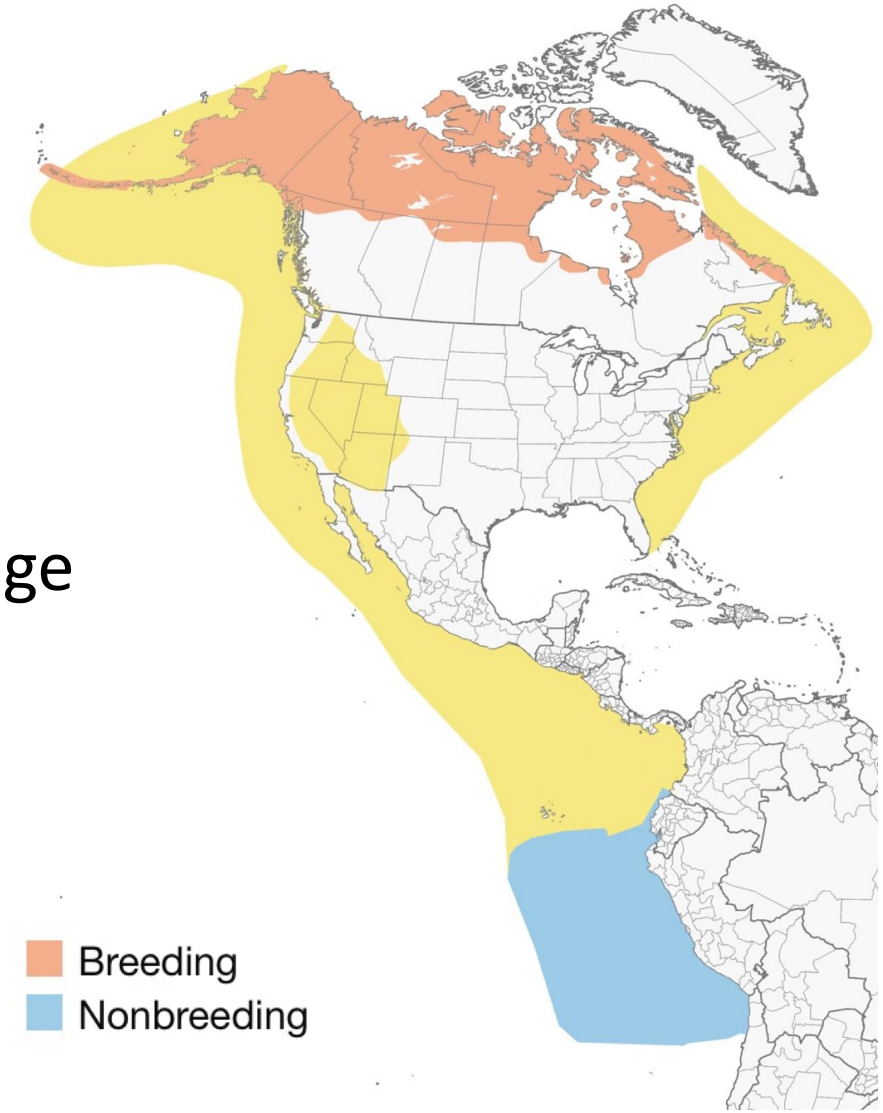
San Francisco Bay Bird Observatory

Phalarope Basics

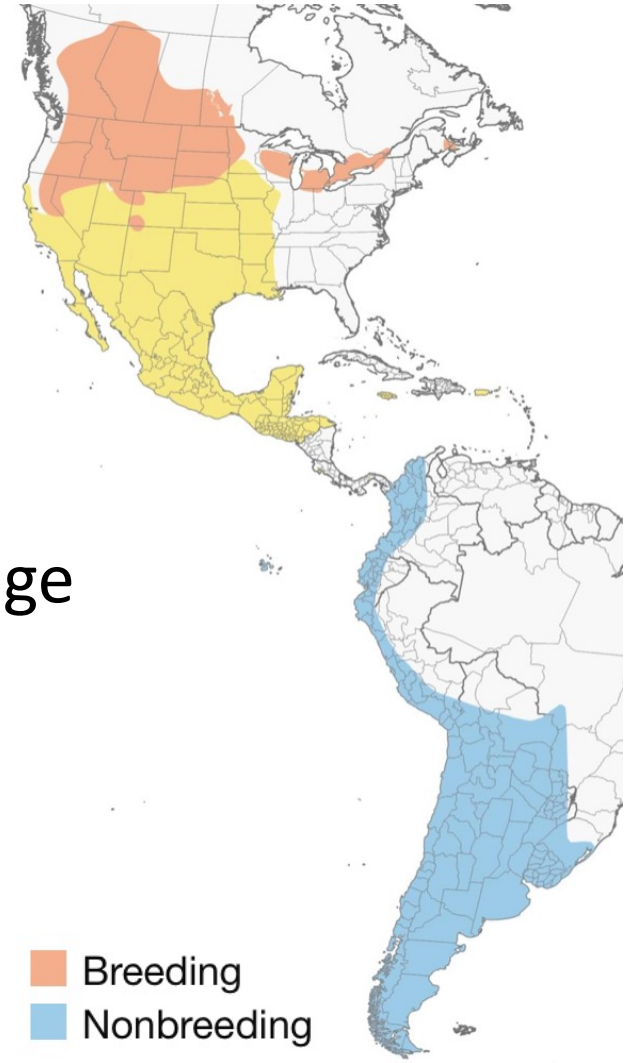
Photo Credits: Mick Thompson https://www.flickr.com/people/mickthompson/

Phalarope Migration

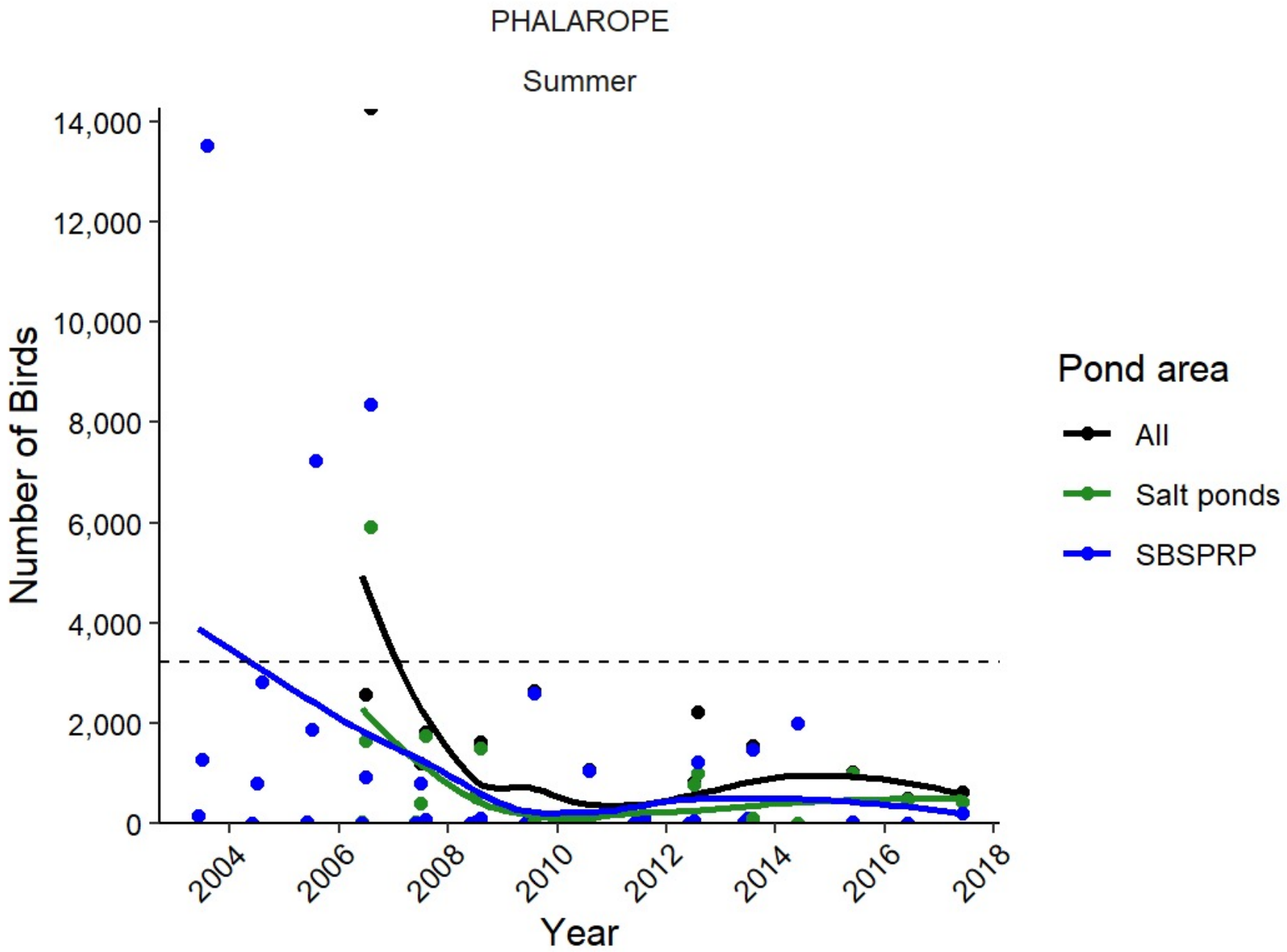
RNPH range



WIPH range



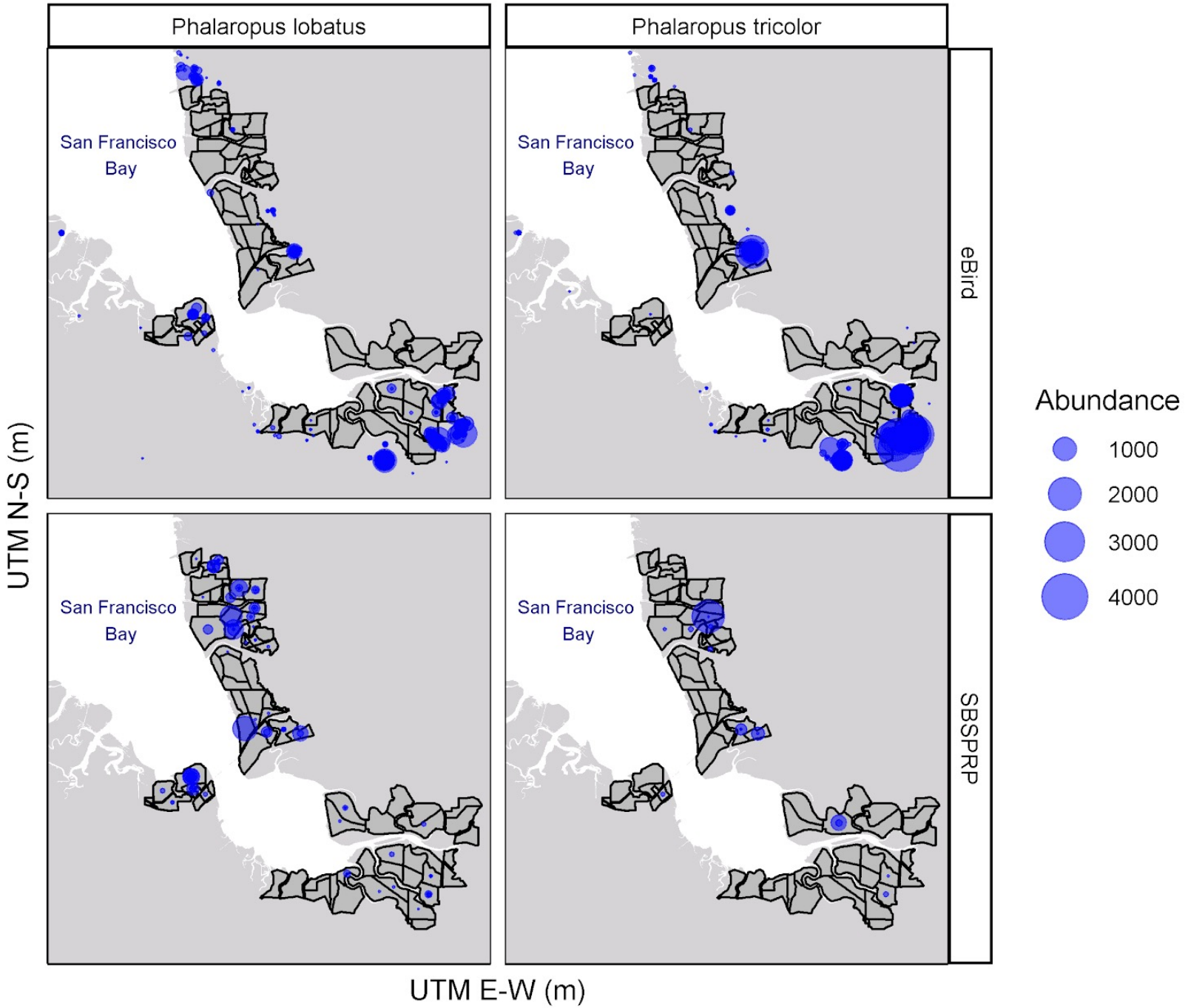
Declines in project footprint



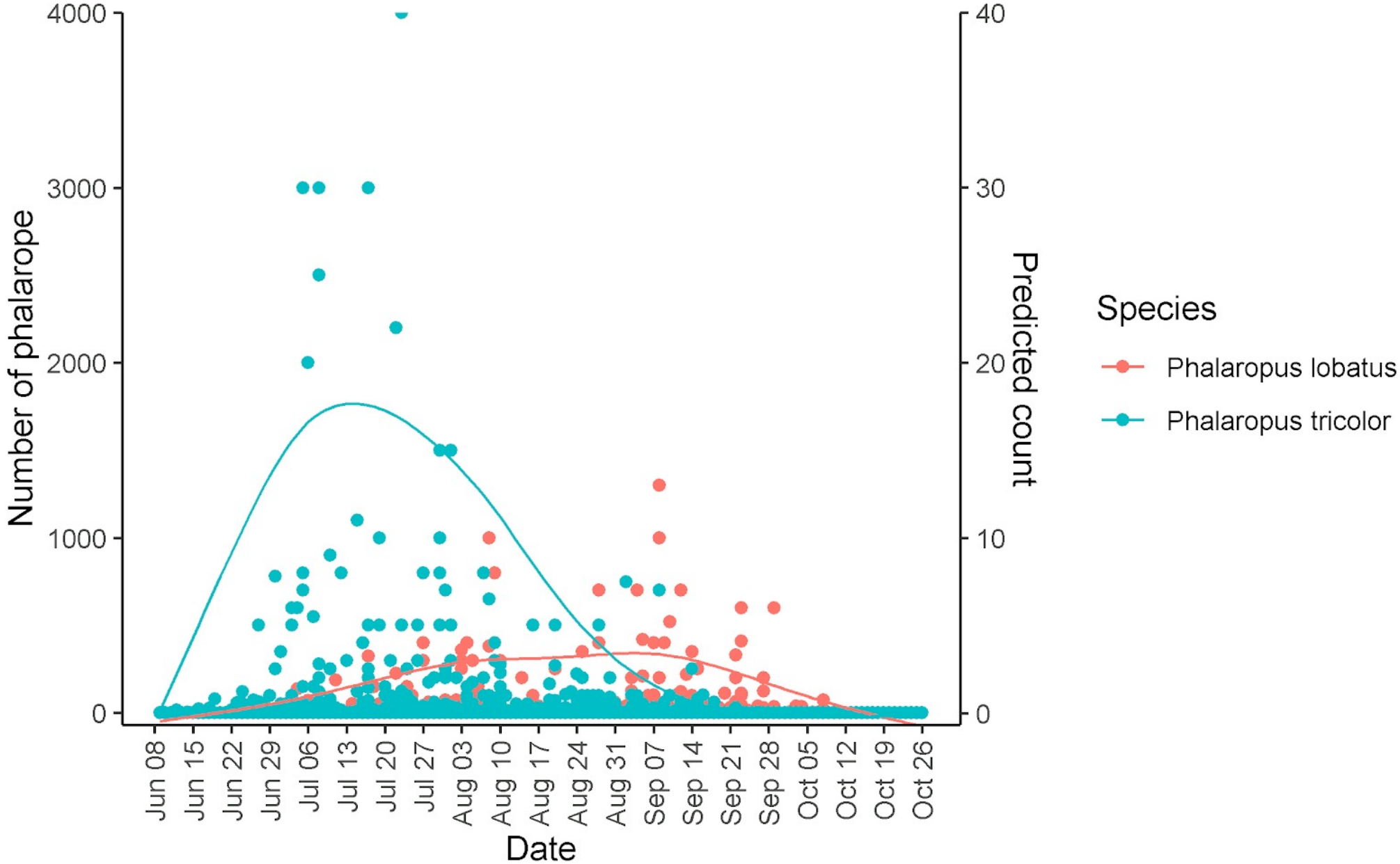
Designing Phalarope Migration Studies

- Goal: Targeted phalarope studies during peak migration
- Data sources:
  - Salt Pond Survey Data 2014-2019
  - Basic eBird dataset 2014-2019
- Collaboration with International Phalarope Working Group

Locations

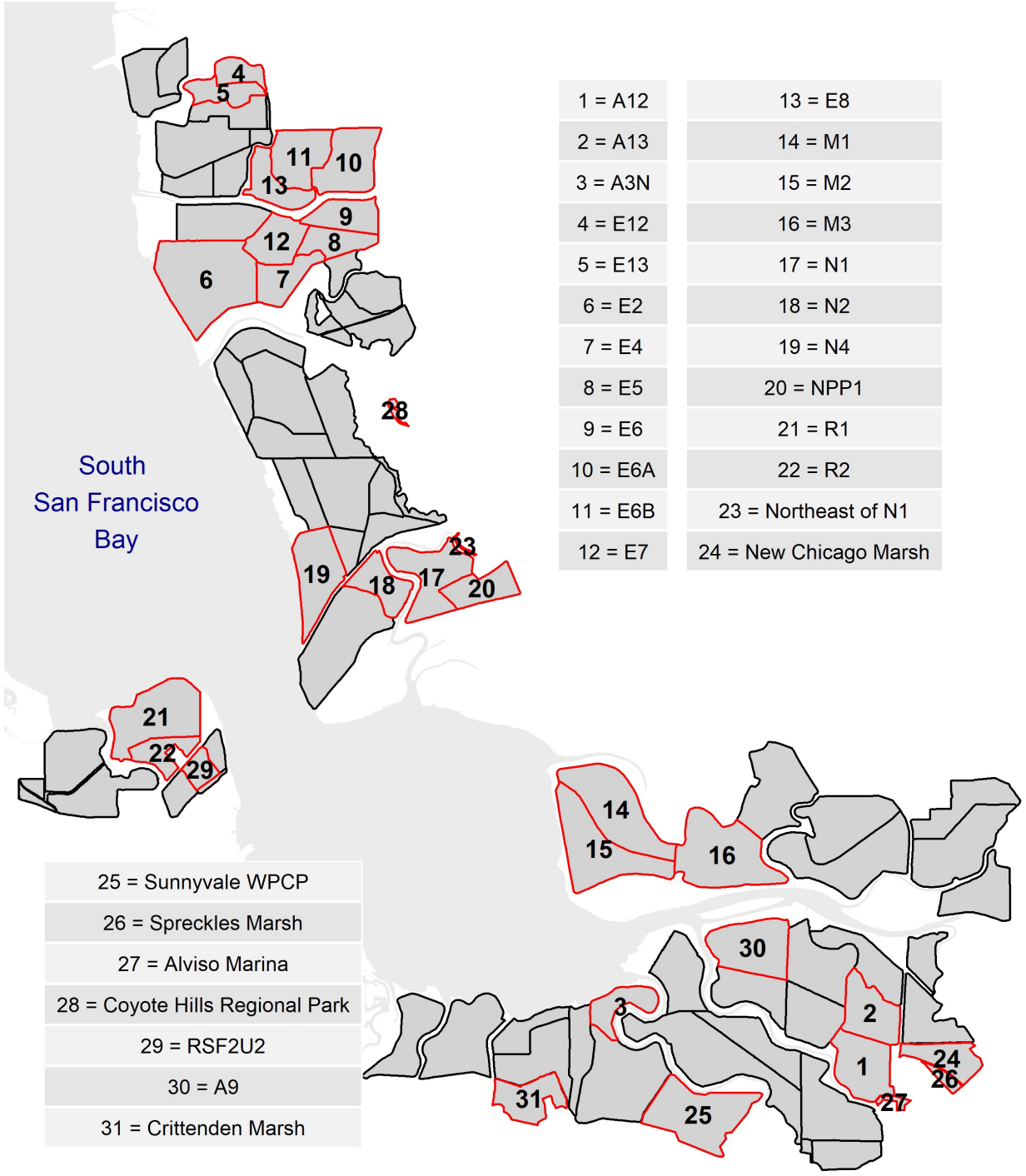

Phalaropus lobatus
Phalaropus tricolor
San Francisco Bay
eBird
SBSPRP
UTM N-S (m)
UTM E-W (m)
Abundance
1000
2000
3000
4000

Timing


4000
3000
2000
1000
0
Number of phalarope
40
30
20
10
0
Predicted count
Jun 08
Jun 15
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Jul 27
Aug 03
Aug 10
Aug 17
Aug 24
Aug 31
Sep 07
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Oct 19
Oct 26
Date
Species
Phalaropus lobatus
Phalaropus tricolor

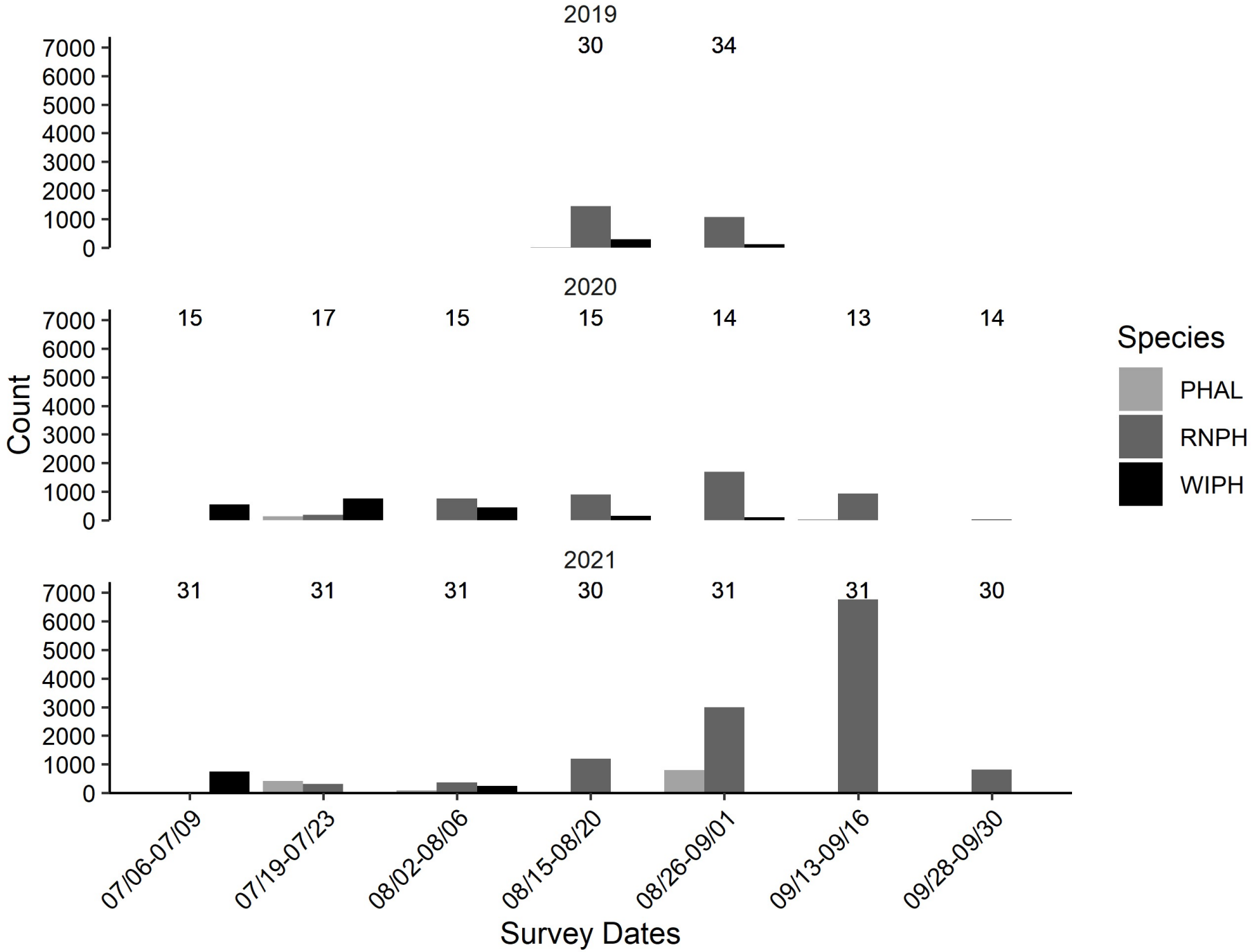
Survey Protocol

- 31 sites (17 SBSPRP ponds, 7 salt production ponds, 7 external sites)
- Survey every two weeks early July-late Sept
  - Adding late June in 2022
- Simultaneous surveys by SFBBO staff + volunteers
- 2019 pilot, 2020 partial, 2021 full



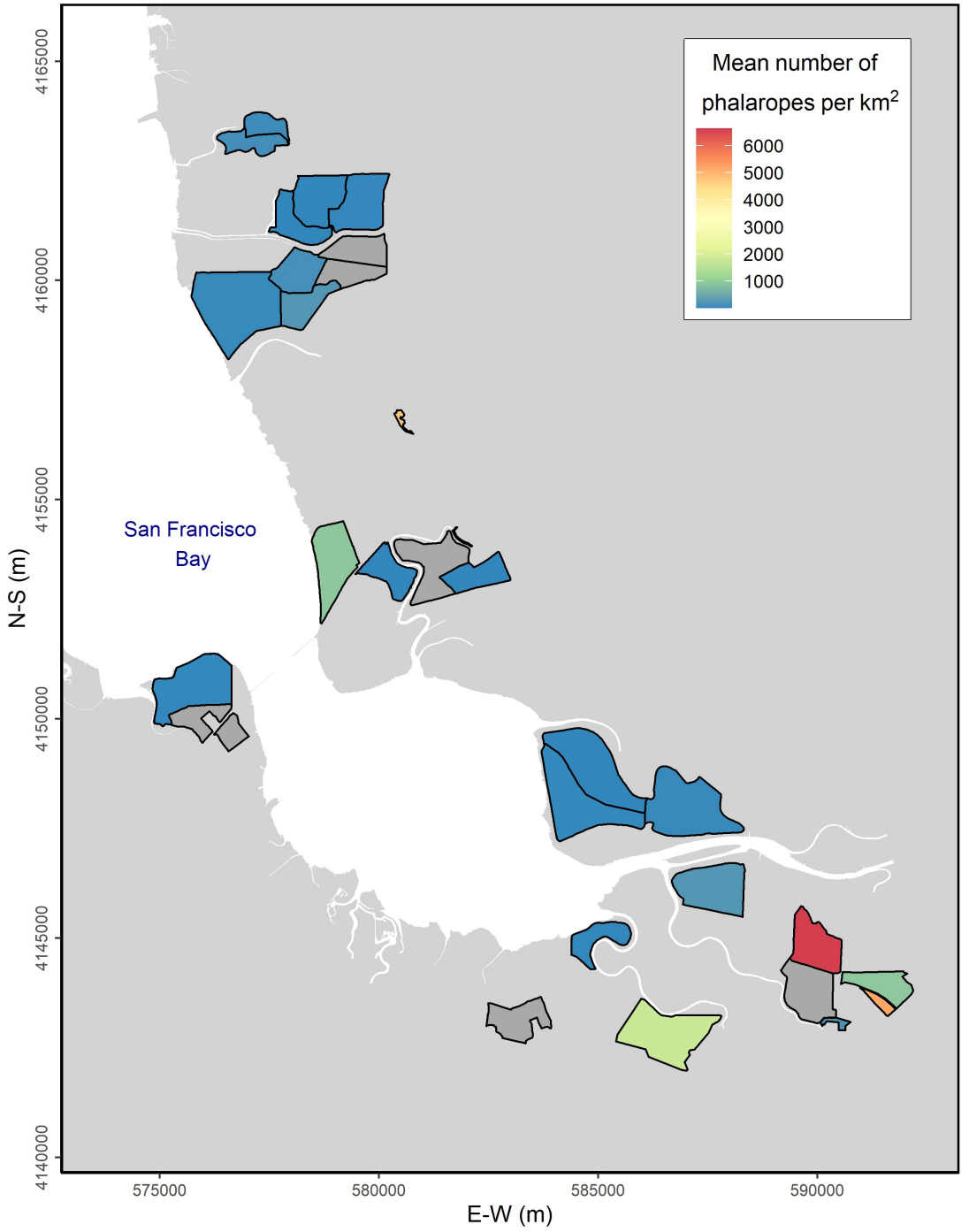
Results

Abundance, all years



Results

Distribution, 2021



Notable Findings

- Peak and total counts for RNPH higher in 2021 than 2020
  - Large counts at sites not surveyed in 2020
- Peak and total counts for WIPH lower in 2021 than 2020
  - Peak during first survey (7/6)
- 3 of top 5 sites outside of salt ponds
  - 4 out of top 10
- Assumptions on salinity preferences unsupported

Challenges

- Accounting for unknown species observations
- Understanding migration patterns
  - Stopover time
  - Movement between sites
- Comparing across methodologies
- Understanding the big picture

What Comes Next?

- 2022 surveys
- Baseline comparison
- Regional evaluation
- Motus tagging at Mono Lake