



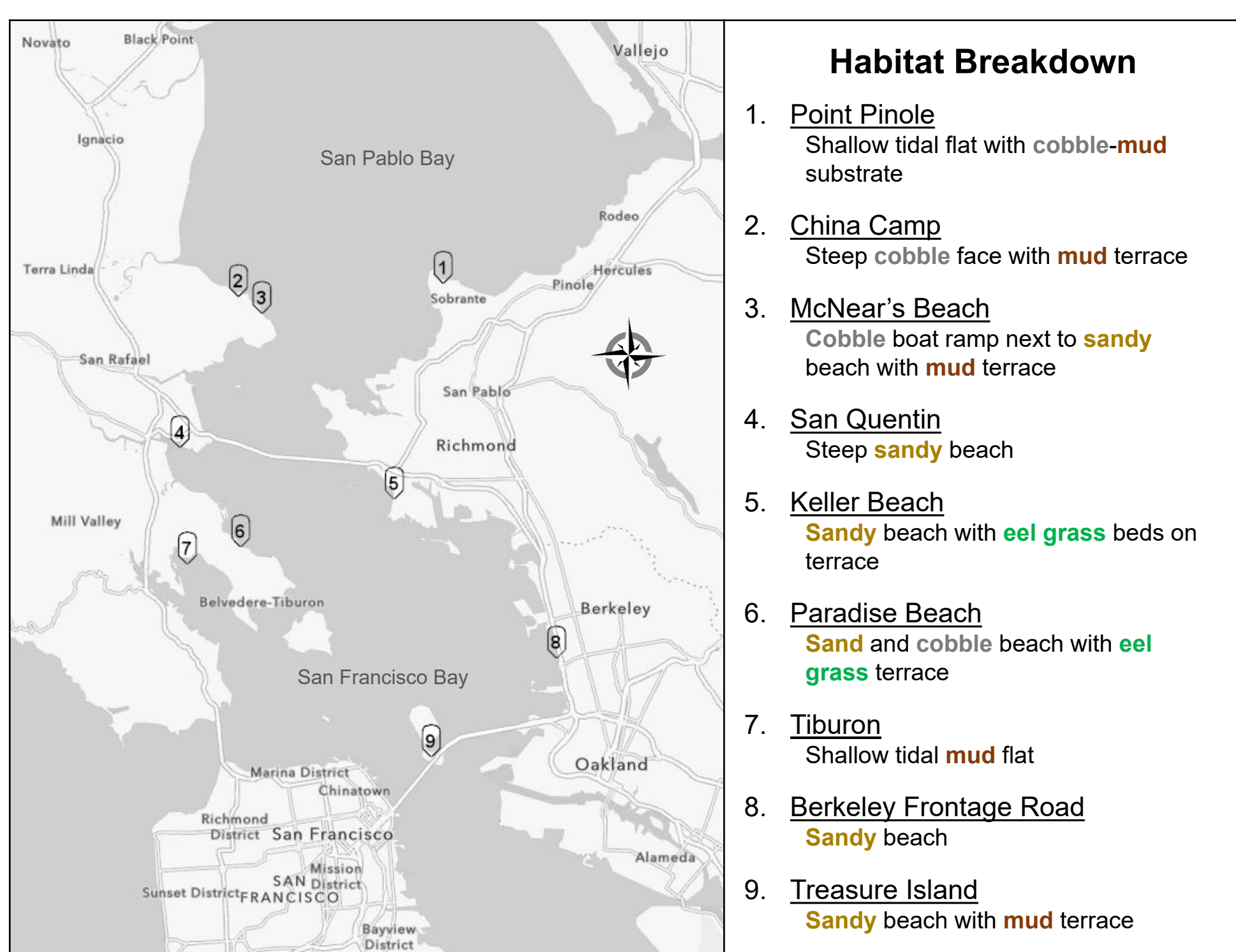
Nearshore Fishes of San Pablo and San Francisco Bays

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Bay Area Beach Seine Sampling Sites

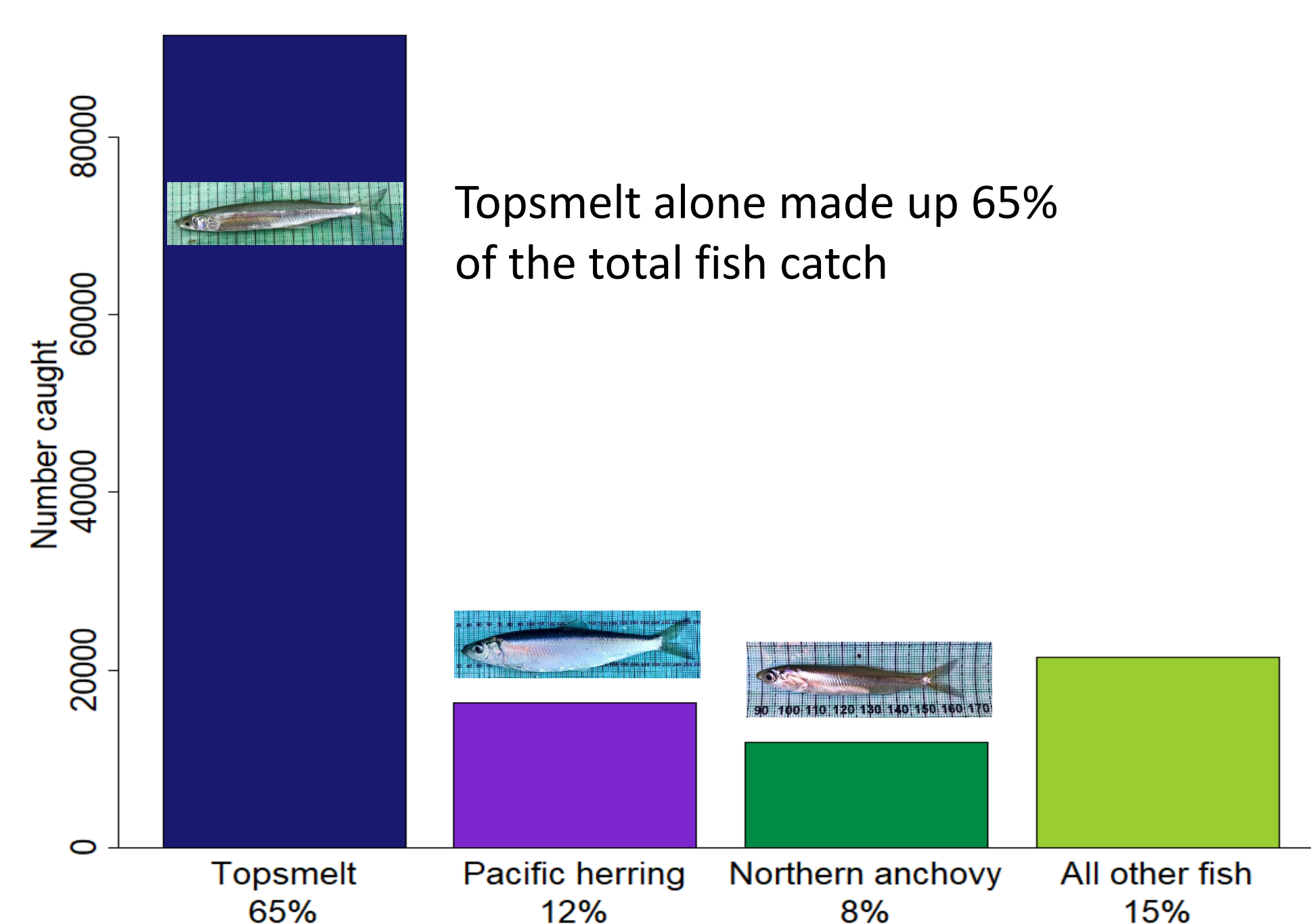
In 1976 nine beach seining sites in San Pablo Bay and San Francisco Bay were added to the Delta Juvenile Fish Monitoring Program to expand the program's spatial coverage of juvenile Chinook salmon, but **what else can we learn from an exploratory analysis of other fish species in the Bay?**



Overall Catch Trends: 1999 to 2019

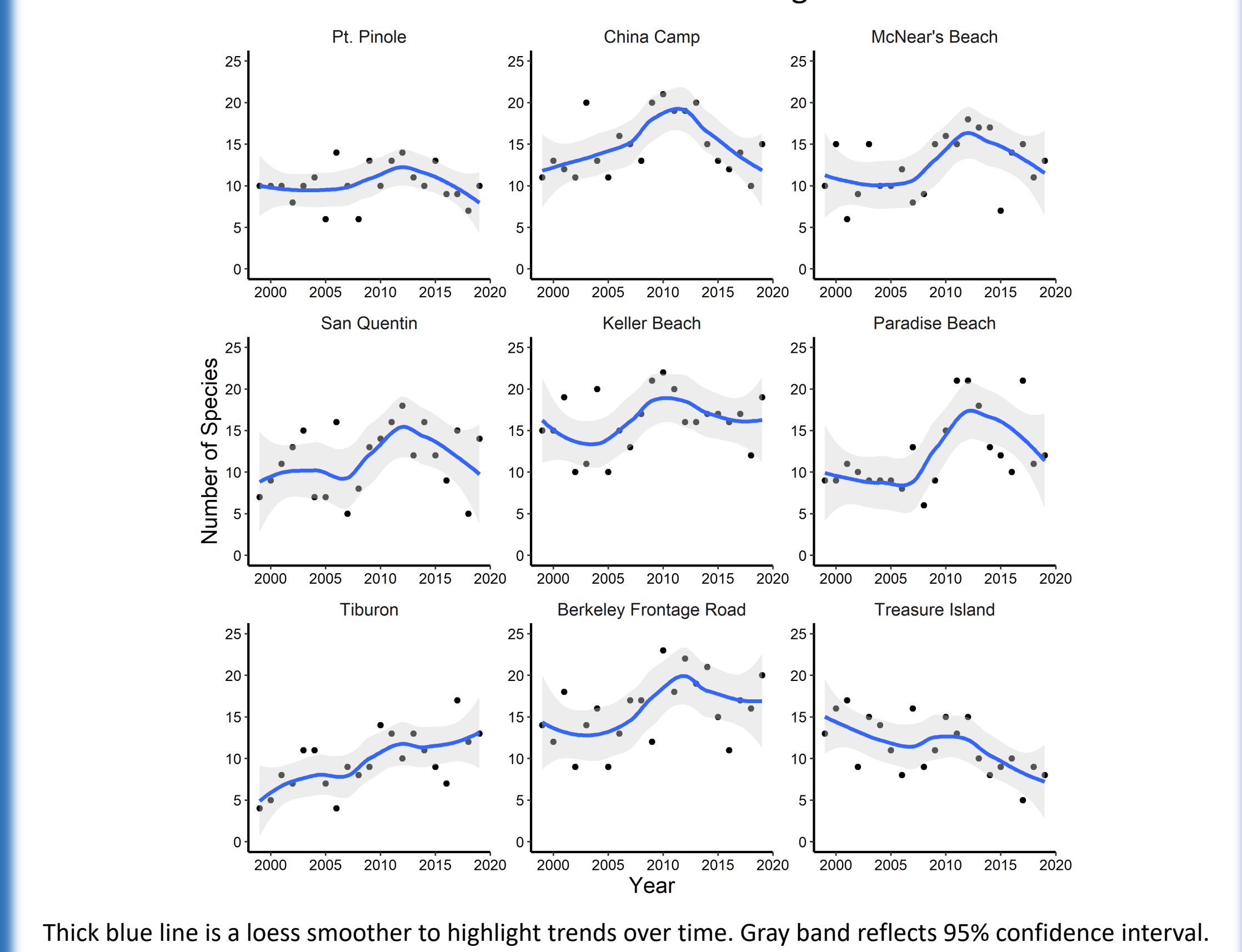
The 12 most commonly caught fish species were:

- 1) Topsmelt
- 2) Pacific Herring
- 3) Northern Anchovy
- 4) Pacific Staghorn Sculpin
- 5) Dwarf Surfperch
- 6) Arrow Goby
- 7) Bay Pipefish
- 8) Shiner Perch
- 9) Yellowfin Goby
- 10) Three-spine Stickleback
- 11) Inland Silverside
- 12) Barred Surfperch

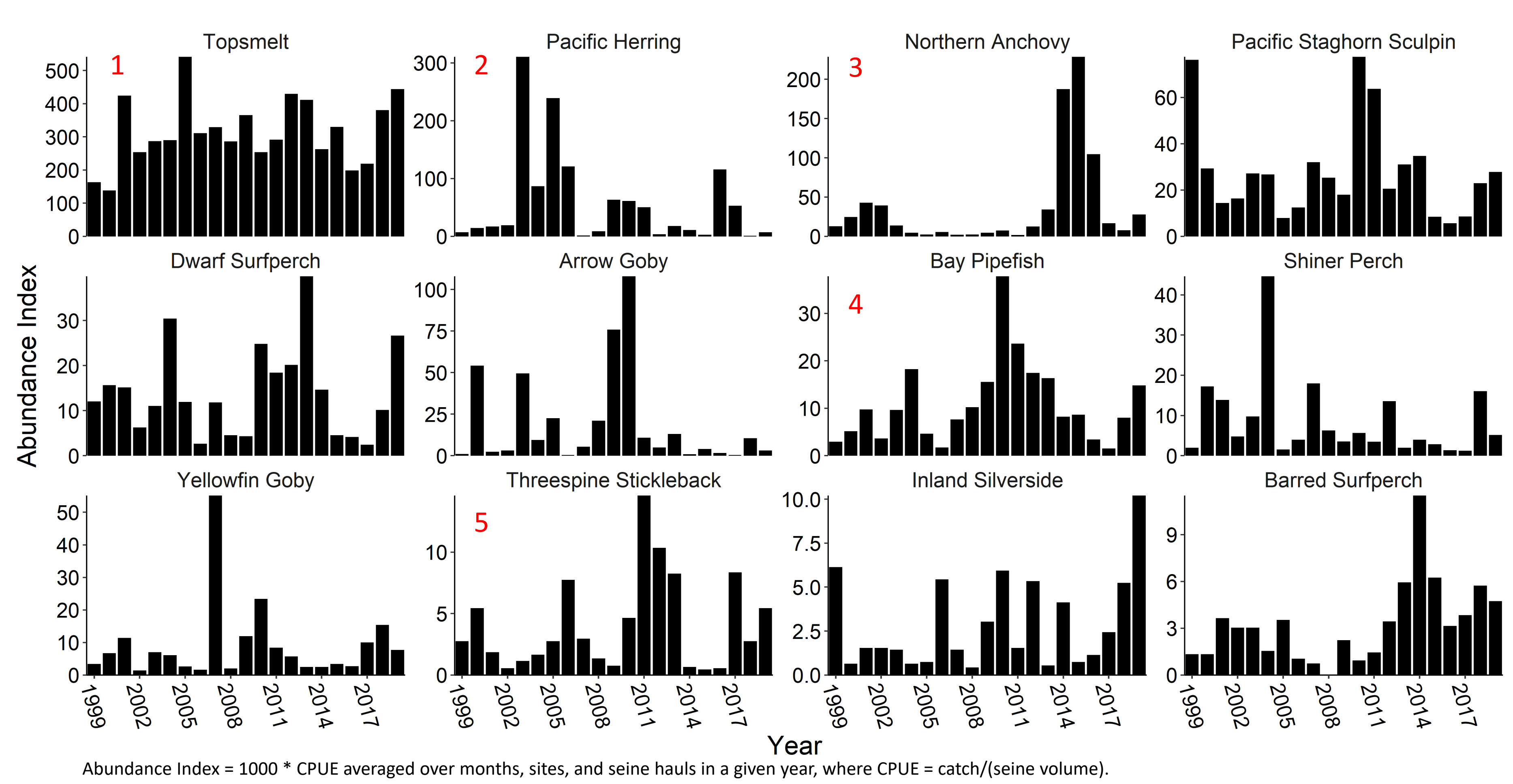


Site Trends: Number of Unique Species per Year

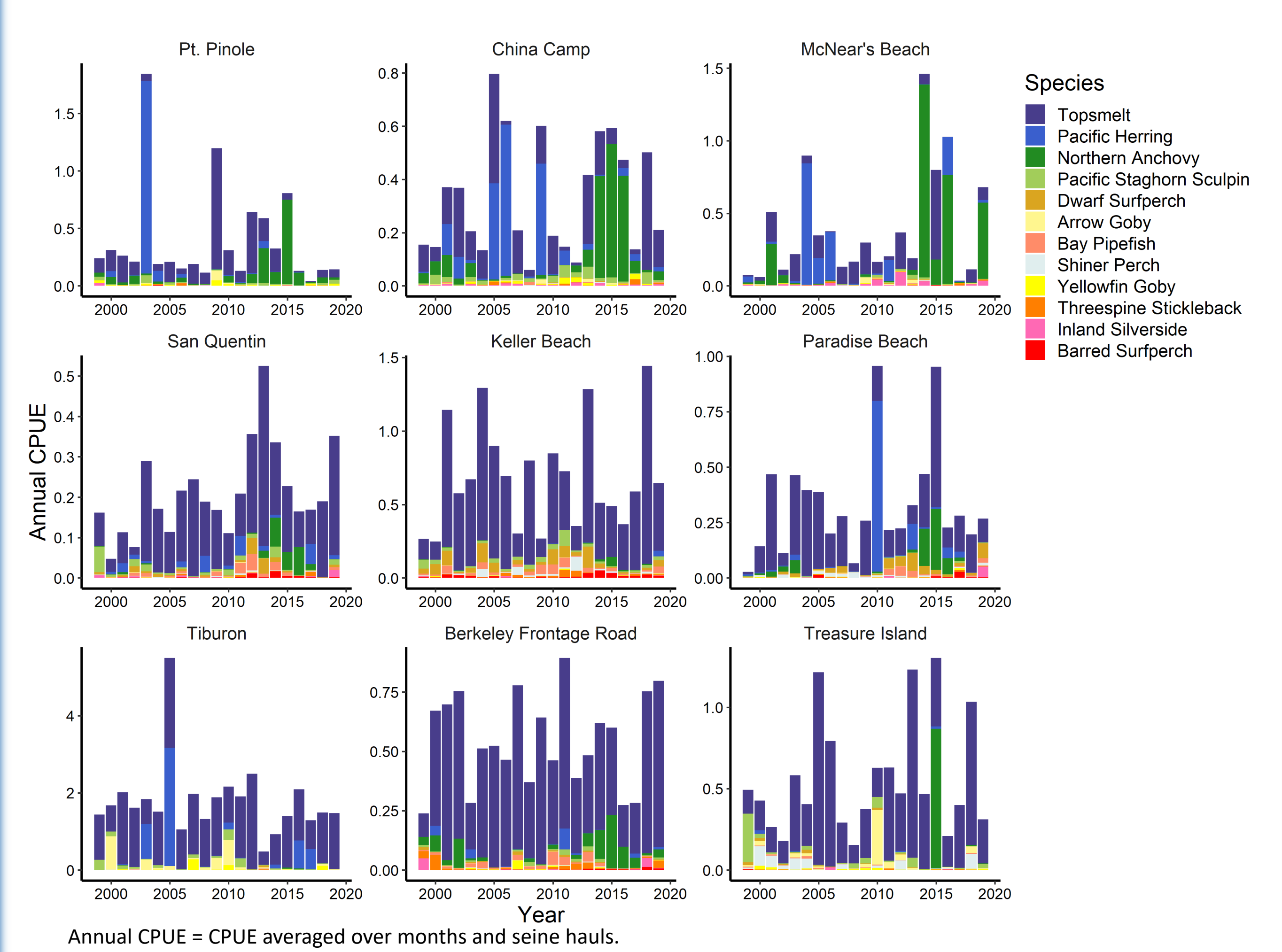
Most sites had temporary increase in number of species observed between 2010 and 2015. However, Tiburon showed an overall increase and Treasure Island showed an overall decrease during this time.



Species Trends: Annual Abundance Indices



Site and Species Trends: Comparison of Annual CPUE



- Topsmelt are found at every site
- Large catches of Pacific Herring and Northern Anchovy do not overlap at any site during a given year
- Does species assemblage change based on habitat type?

Data and Methodology

- Examined beach seine data over a 20 year period (1999-2019), due to inconsistencies in sampling prior to this time period
- Nine fixed San Francisco and San Pablo Bay beach seine sites
- Sites sampled bi-monthly year-round using beach seine (15m x 1.2m) with 3mm mesh
- Data entered into Delta Juvenile Fish Monitoring Program's online database and is publicly available online through Environmental Data Initiative: <https://doi.org/10.6073/pasta/41b9eebed270c0463b41c5795537ca7c>
- Catch per unit effort (CPUE) calculated as Catch/Seine Volume

Future Research

- Analyze all shrimp, jellyfish, and 72 fish species that occur in dataset
- Investigate climate change effects on coastal fish assemblages
- Integrate Tidal data from NOAA observation stations into analysis
- Investigate the role of habitat on fish assemblages
- Couple environmental data to help explain relative abundance and distribution of species in San Francisco and San Pablo Bay