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Advanced Survey Technologies
Southwest Fisheries Science Center

*Methods for computing estimates of NSP *P. sardine* biomass from the 2024 Summer ATM Survey of CPS in the California Current Ecosystem*

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NOAA/SWFSC/FRD

Advanced Survey Technologies (AST) Group

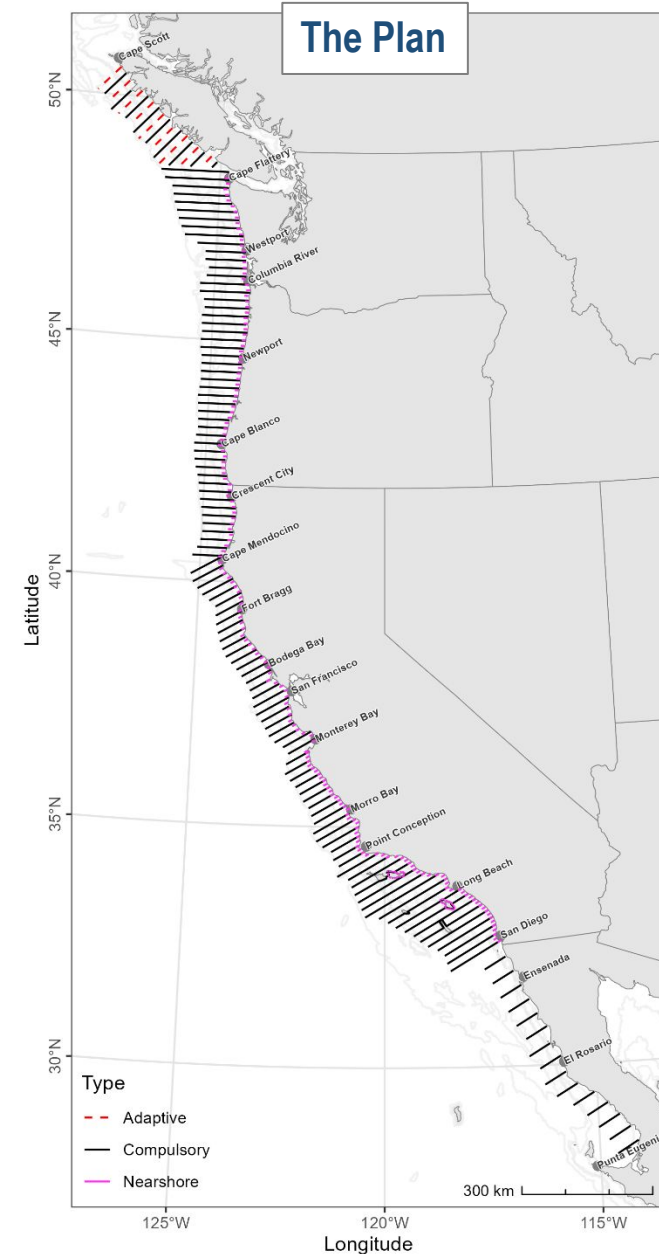
Draft work presented to the PFMCC SSC CPS subcommittee, February 26, 2025.

This presentation does not necessarily reflect the official views or policies of the National Marine Fisheries Service, the National Oceanic and Atmospheric Administration, the Department of Commerce, or the Administration

Survey Design, Plan, & Execution

Plan:

- **Lasker (85 DAS):**
 - Baja CA to Vancouver Is. (80 DAS total)
 - 5 DAS for gear trials
- **Long Beach Carnage (23 DAS):**
 - San Diego-Monterey
- **Lisa Marie (38 DAS):**
 - Monterey to Cape Flattery



Survey Design, Plan, & Execution

Plan:

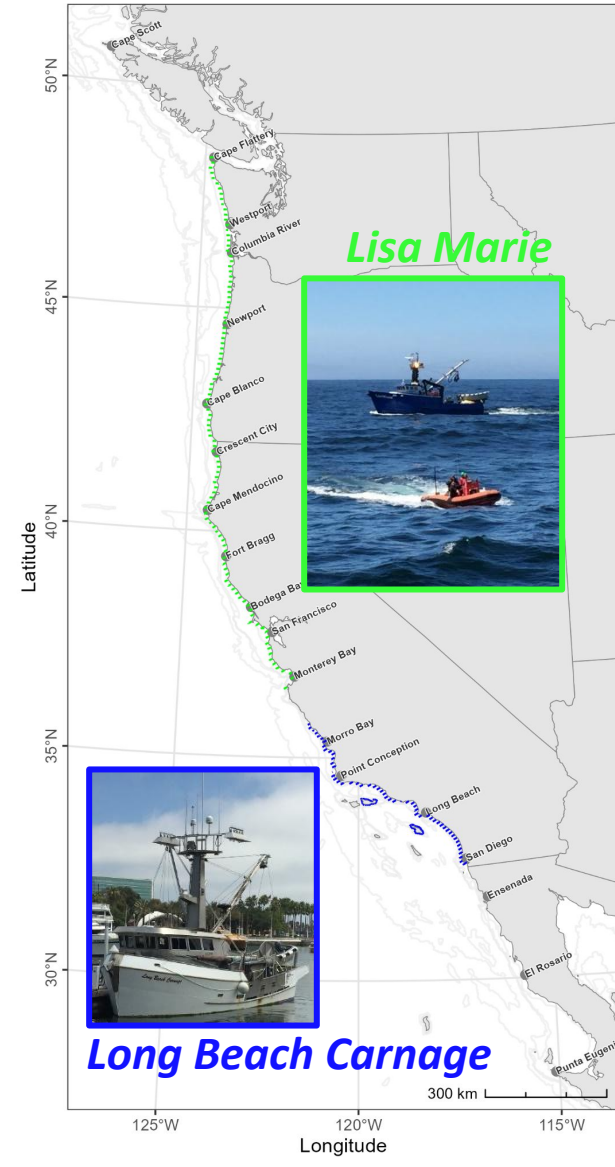
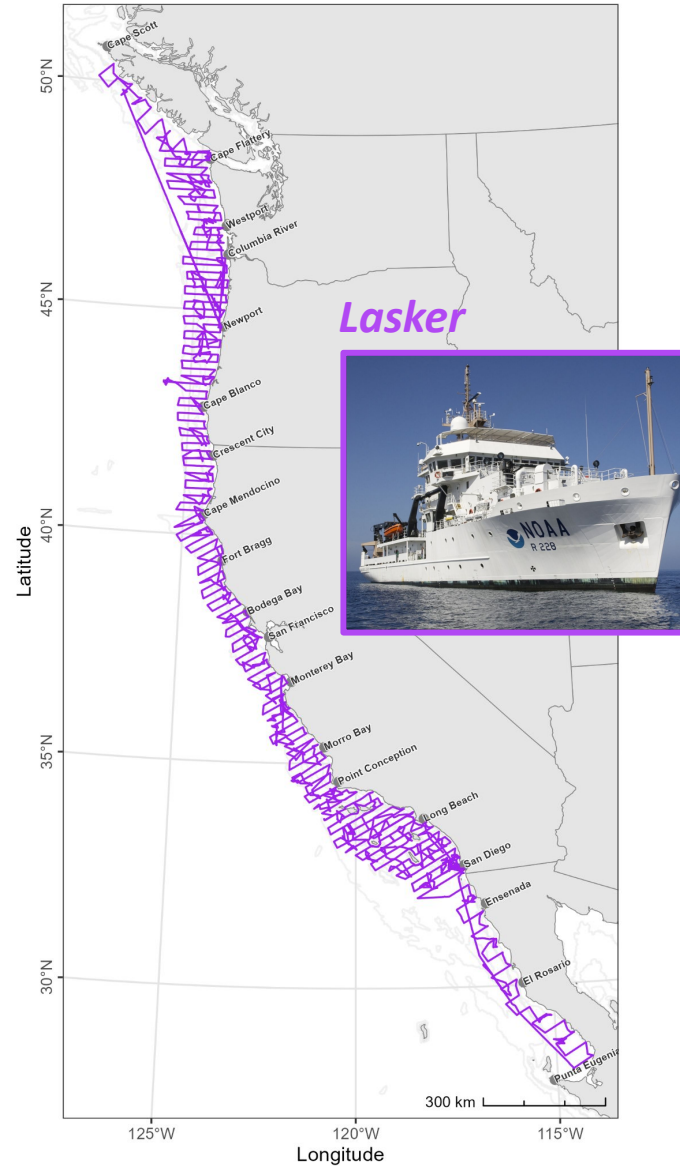
- **Lasker (85 DAS):**
 - Baja CA to Vancouver Is. (80 DAS total)
 - Gear trials (5 DAS)
- **Long Beach Carnage (23 DAS):**
 - San Diego-Monterey
- **Lisa Marie (38 DAS):**
 - Monterey to Cape Flattery (32 DAS)
 - Trawl-seine comparison (6 DAS)

Actual:

- **Lasker (75 DAS):**
 - Baja CA to Vancouver Is.
- **Long Beach Carnage (14 DAS*):**
 - San Diego to Big Sur (10 unsampled transects)
- **Lisa Marie (22 DAS*):**
 - Monterey to Cape Flattery (15 DAS)
 - Trawl-seine comparison (7 DAS)

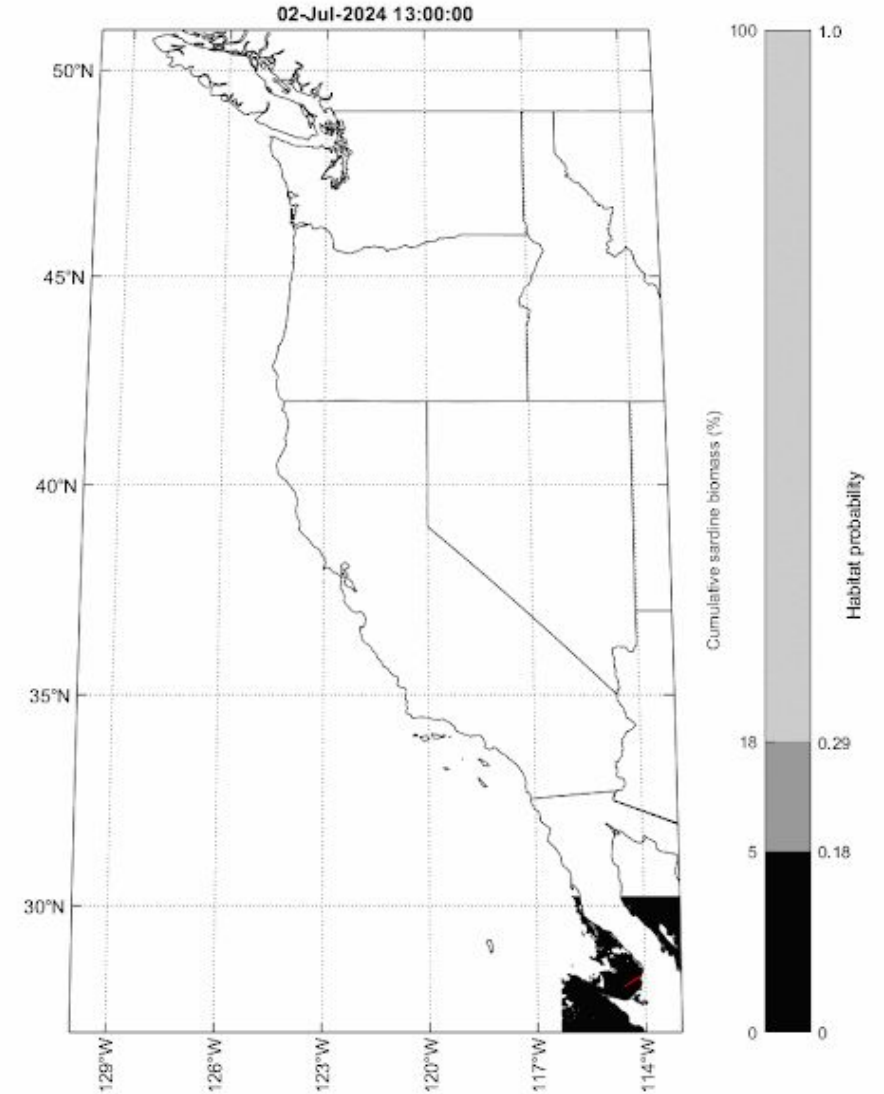
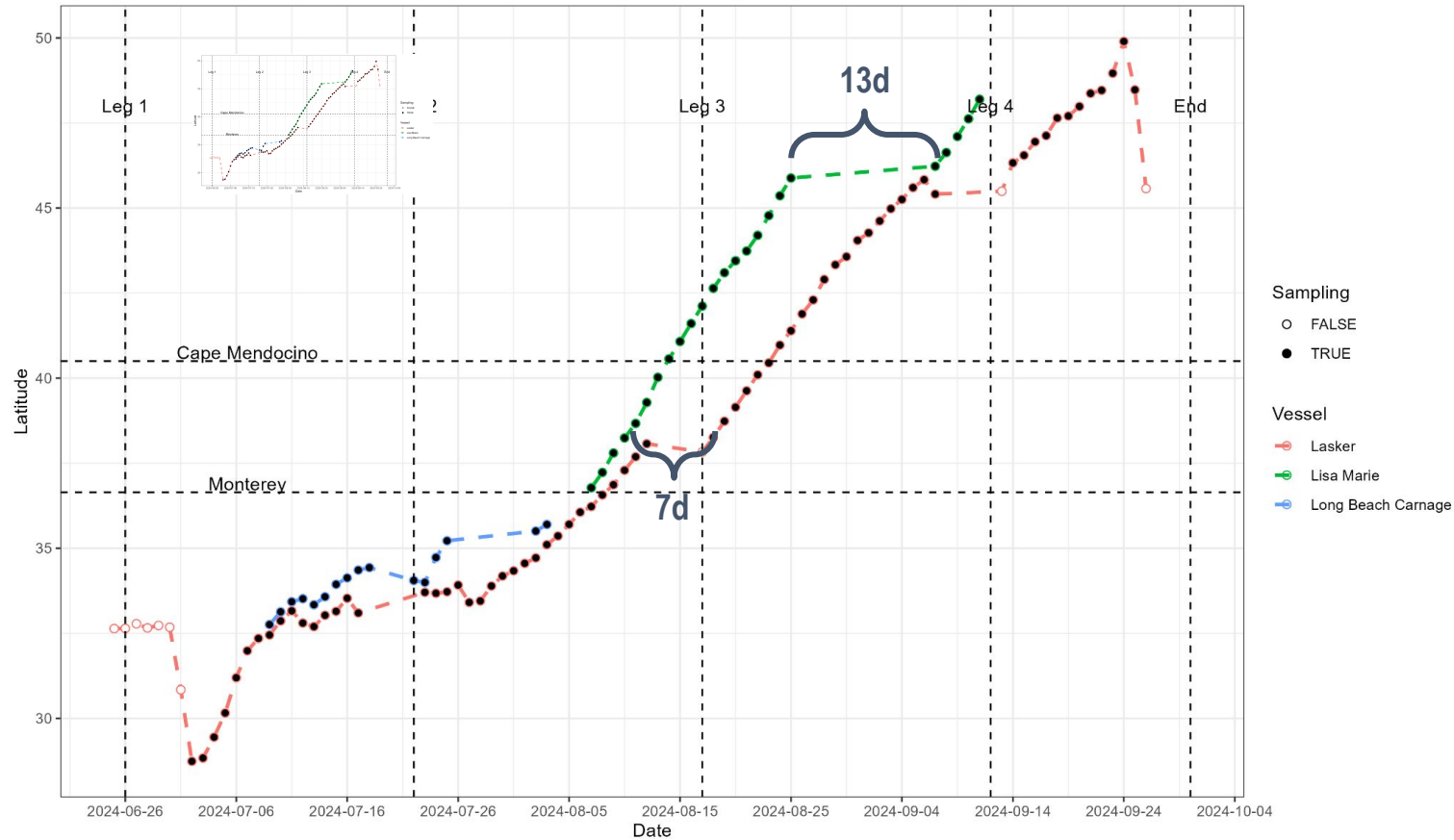
*Actual nearshore DAS excludes transits and weather days

Actual

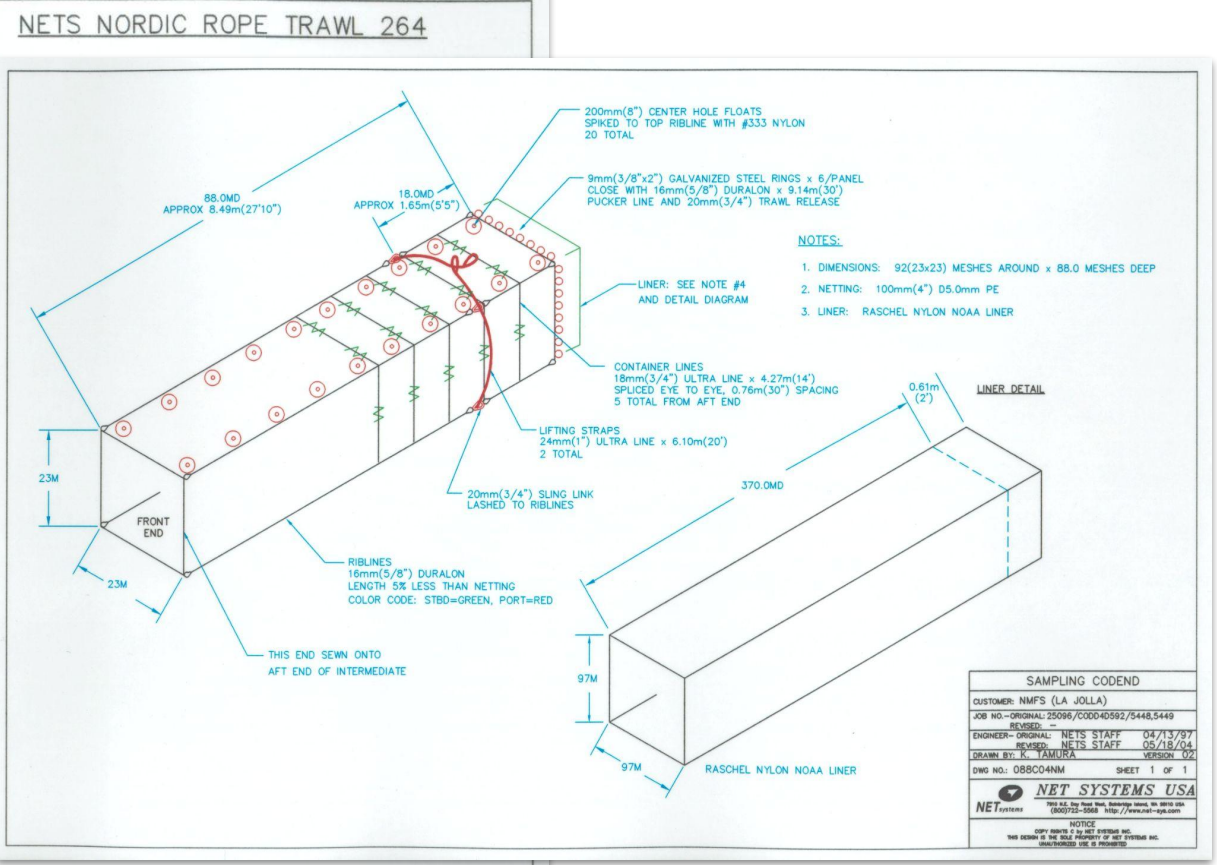
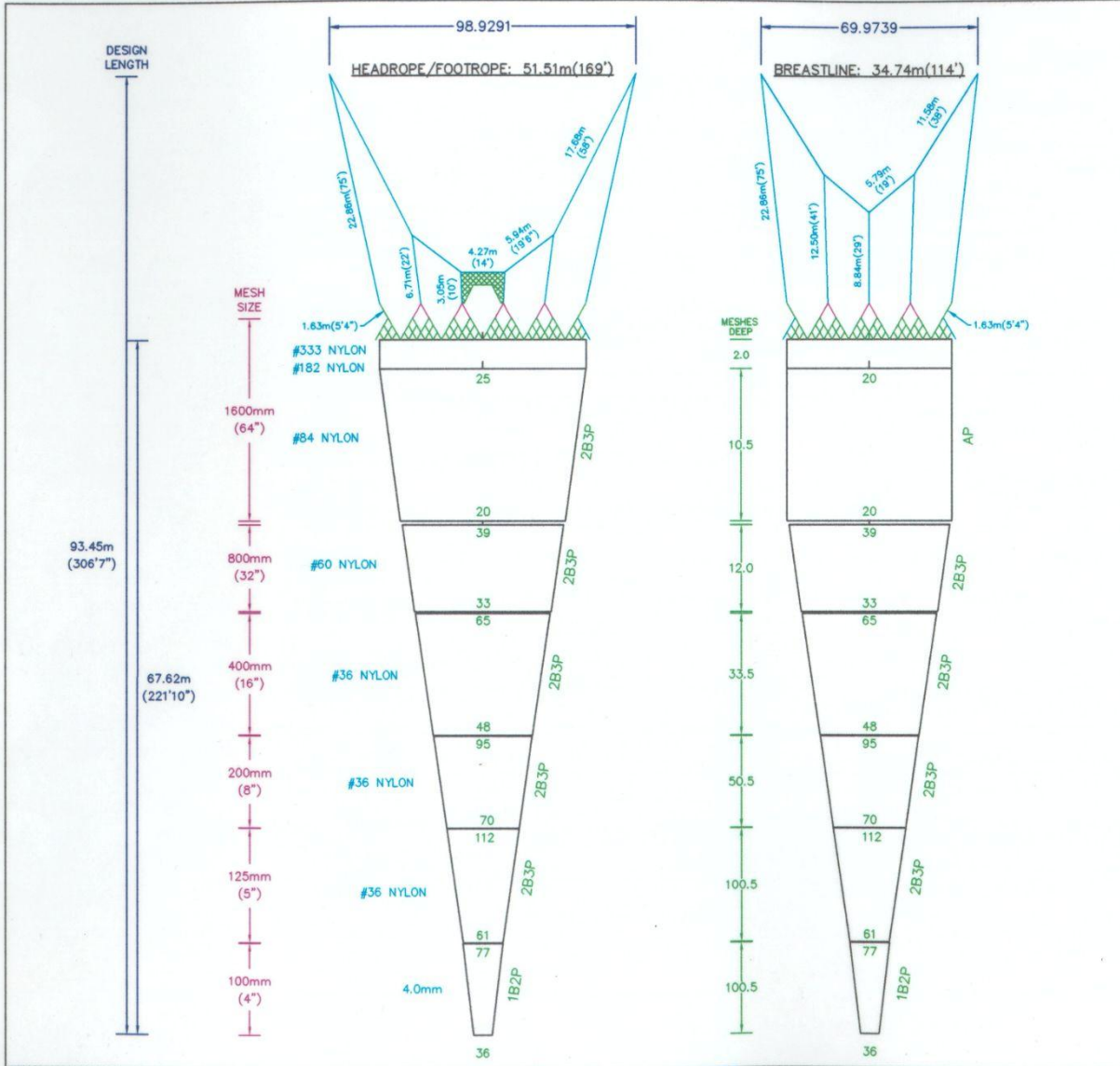


Survey Design, Plan, & Execution

Vessel coordination



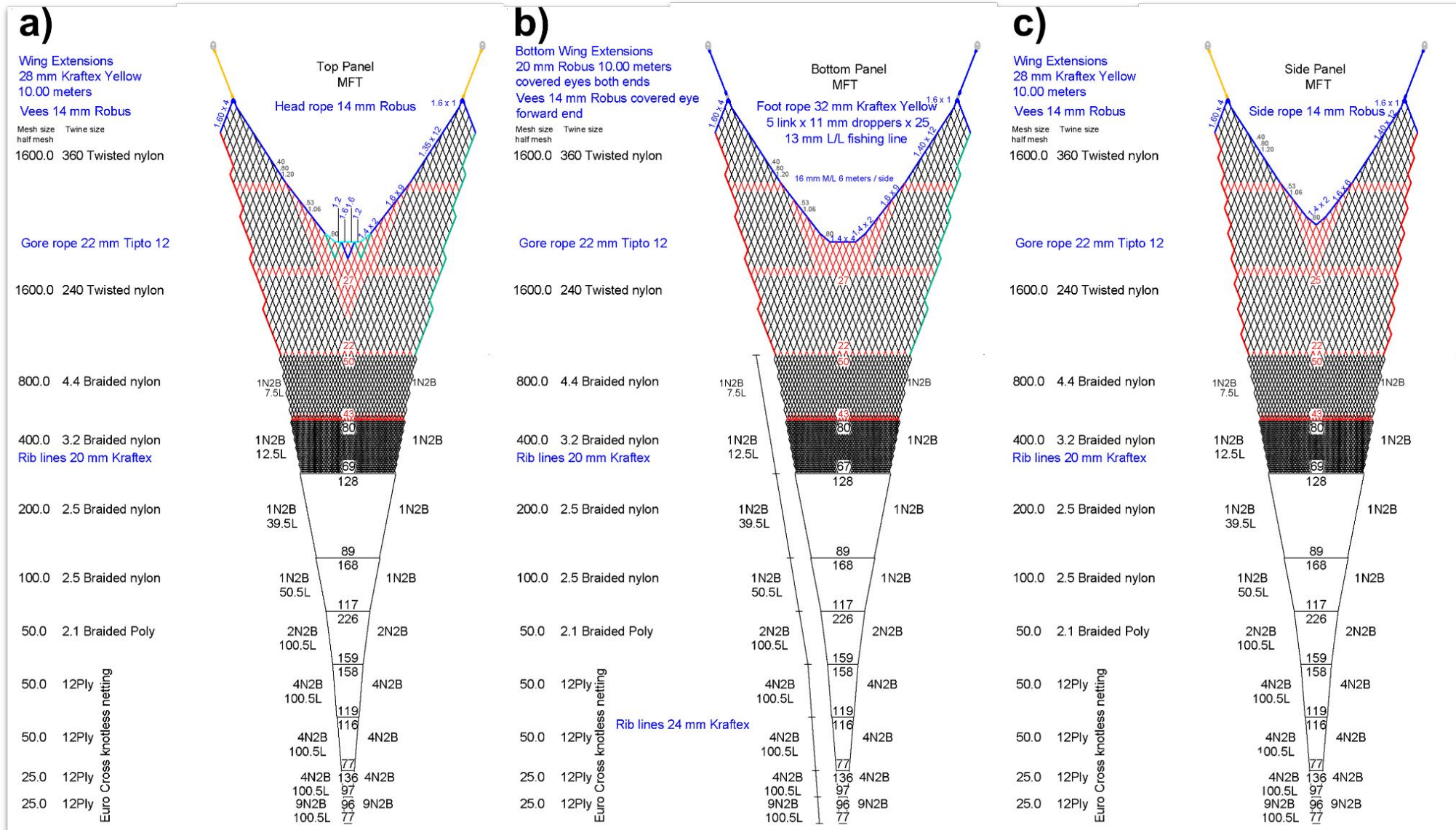
Nordic 264



| | |
|--|--------------|
| NRT 25/20/64" | |
| CUSTOMER: NMFS | |
| JOB NO.-ORIGINAL: 25096/NRT264/5446,5447 | |
| REVISED: - | |
| ENGINEER- ORIGINAL: H. KINOSHITA | 01/20/97 |
| REVISED: K. TAMURA | 05/18/04 |
| DRAWN BY: CHRIS POZ/KT | VERSION 01 |
| DWG NO.: 264NRT10 | SHEET 1 OF 2 |
| NET SYSTEMS USA | |
| 7910 U.S. Bay Road West, Beahm, WA 98110 USA (800)722-5568 http://www.net-sys.com | |
| NOTICE COPY RIGHTS © by NET SYSTEMS INC. THIS DESIGN IS THE SOLE PROPERTY OF NET SYSTEMS INC. UNAUTHORIZED USE IS PROHIBITED. | |

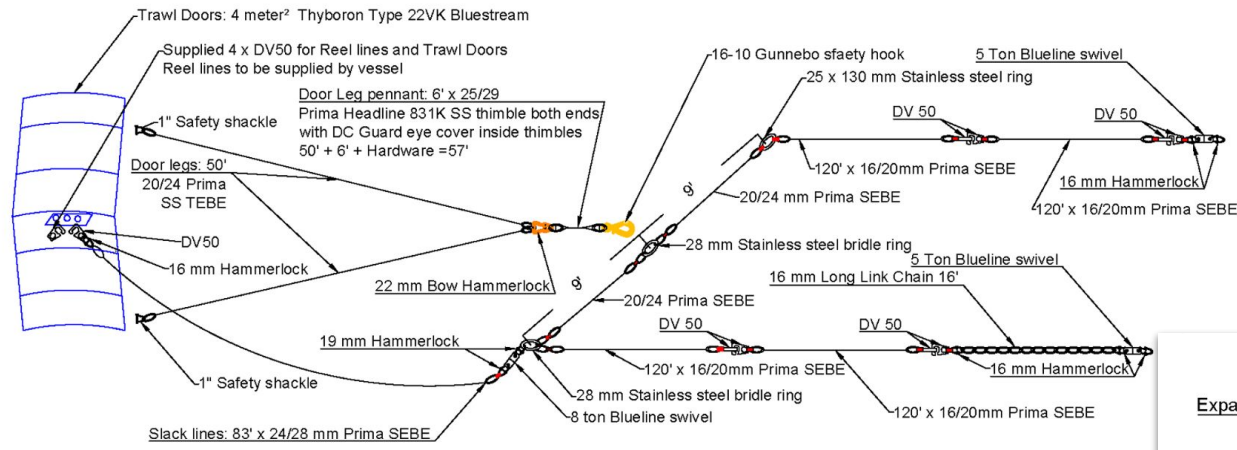
| | |
|--|--------------|
| SAMPLING CODEND | |
| CUSTOMER: NMFS (LA JOLLA) | |
| JOB NO.-ORIGINAL: 25096/CODD40592/5448,5449 | |
| REVISED: - | |
| ENGINEER- ORIGINAL: NETS STAFF | 04/13/97 |
| REVISED: NETS STAFF | 05/18/04 |
| DRAWN BY: K. TAMURA | VERSION 02 |
| DWG NO.: 088C04NM | SHEET 1 OF 1 |
| NET SYSTEMS USA | |
| 7910 U.S. Bay Road West, Beahm, WA 98110 USA (800)722-5568 http://www.net-sys.com | |
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Multifunction Trawl Net System (MFT)

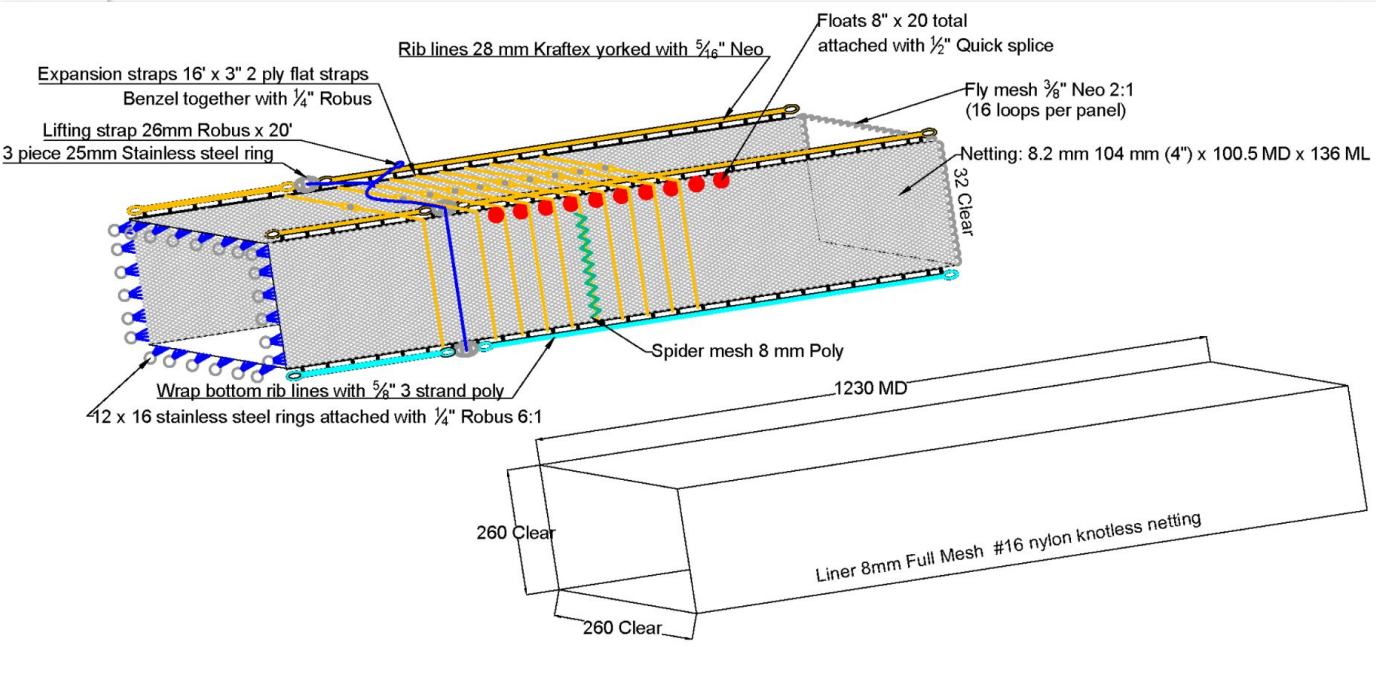


Multifunction Trawl Net System (MFT)

Main wire shackle:
 1 1/2" HGPS safety shackle.
 Also supplied 2 x 22 mm Hammerlocks
 to connect to main wire



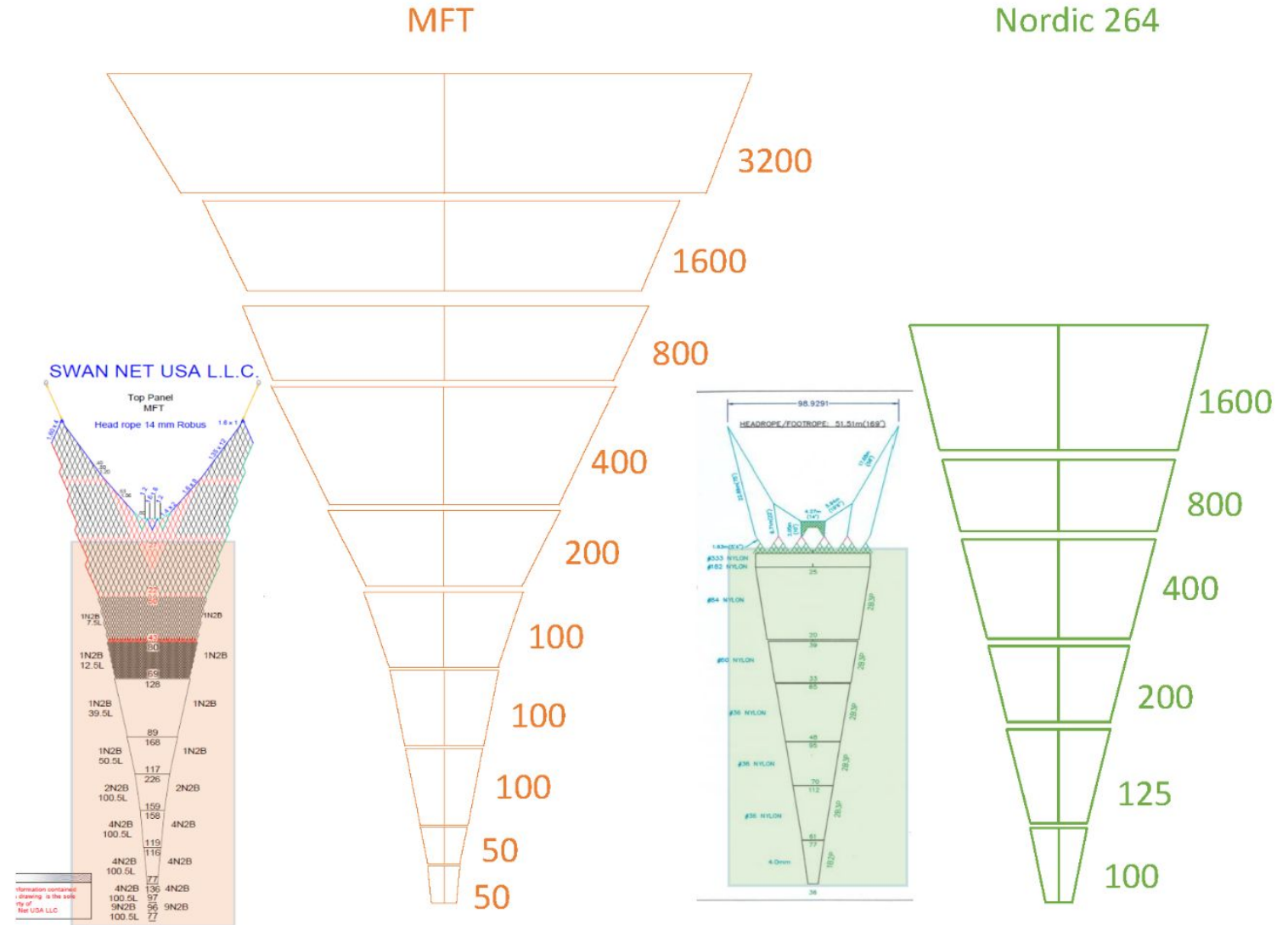
Aft end of Top bridles and both ends of Top bridle extents
 marked with Blue Poly Twine.
 Aft end of Bottom bridles and both ends of Bottom bridle
 marked with grey poly twine.



Nordic 264 versus MFT

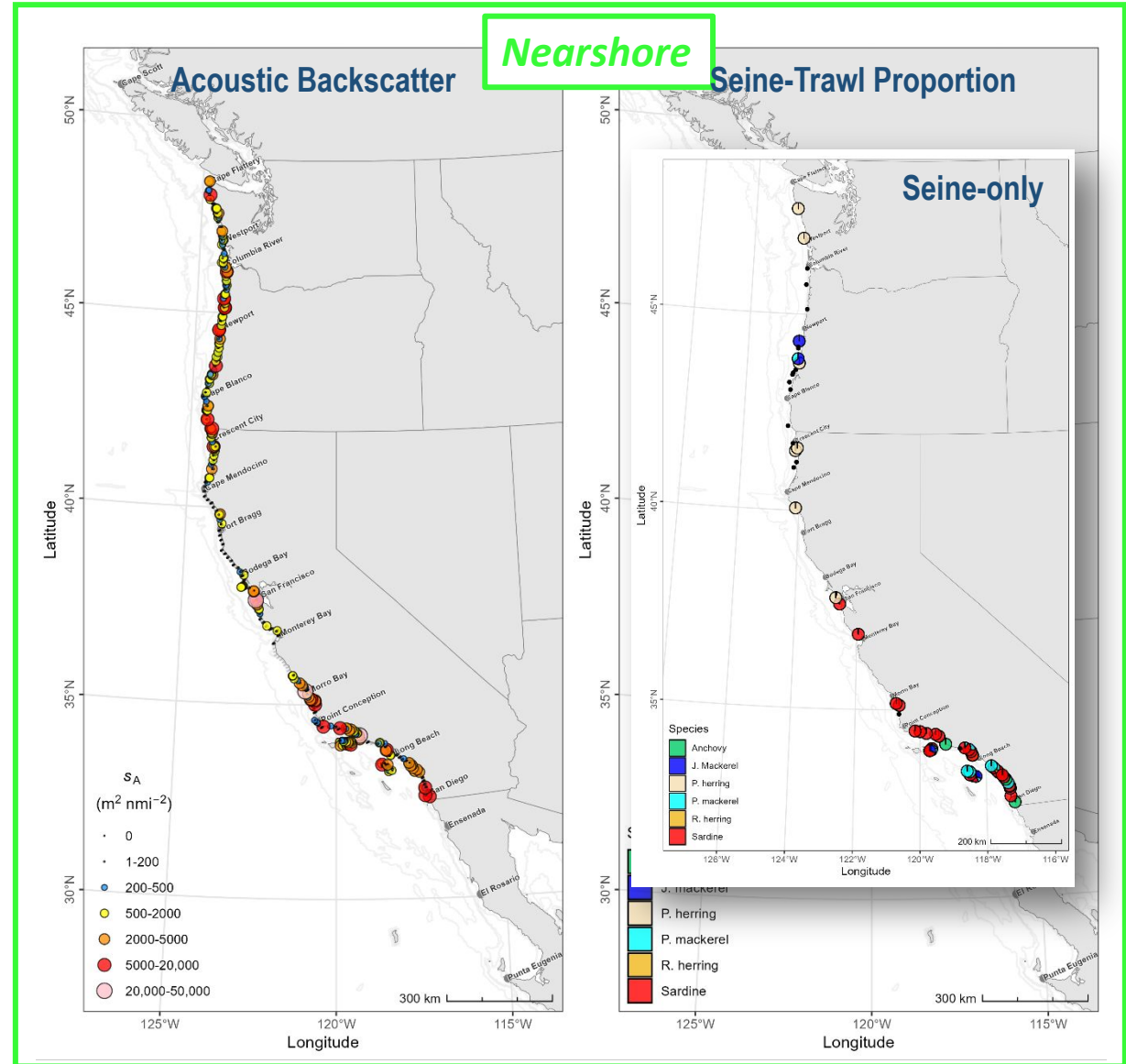
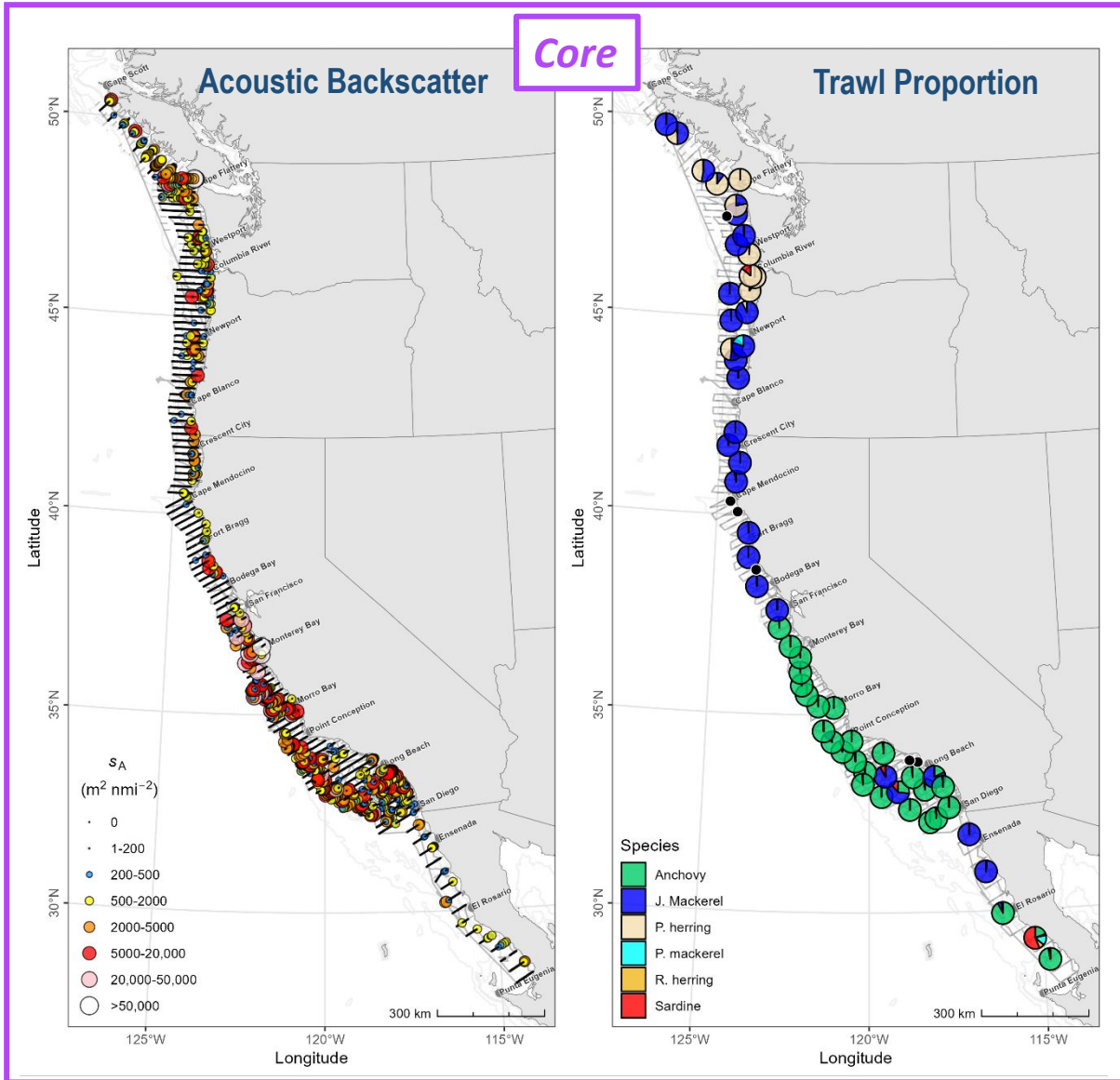
MFT vs Nordic 264 to scale (note, only the highlighted area of each net is drawn)

| | Nordic 264 | MFT |
|------------------------------|--------------------|--------------------|
| Height | 15 m | 18 m |
| Spread | 20 m | 36 m |
| Mouth area (m ²) | 300 m ² | 648 m ² |
| Codend mesh | 8 mm | 8 mm |
| Duration | 45 min | 30 min |

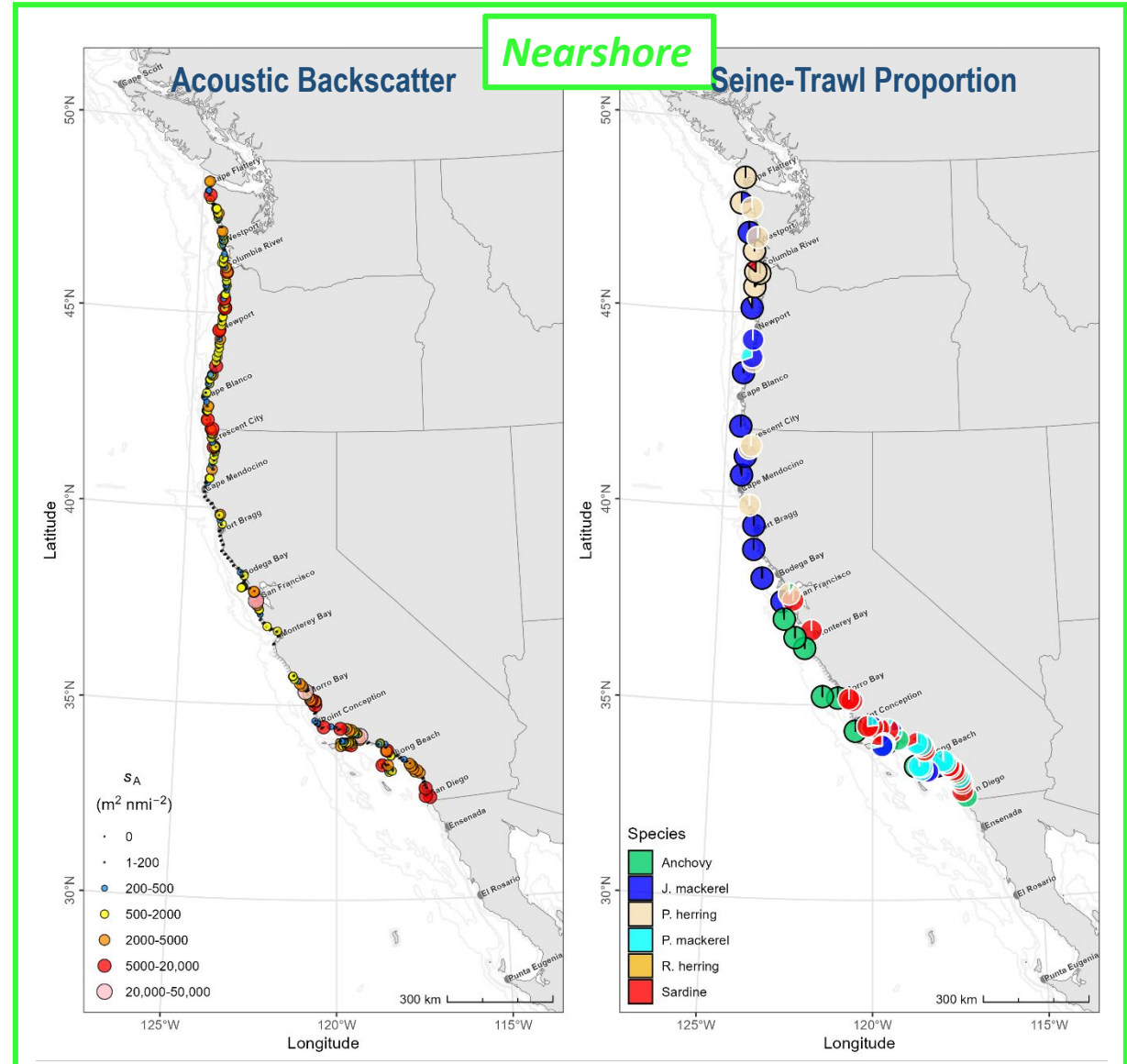
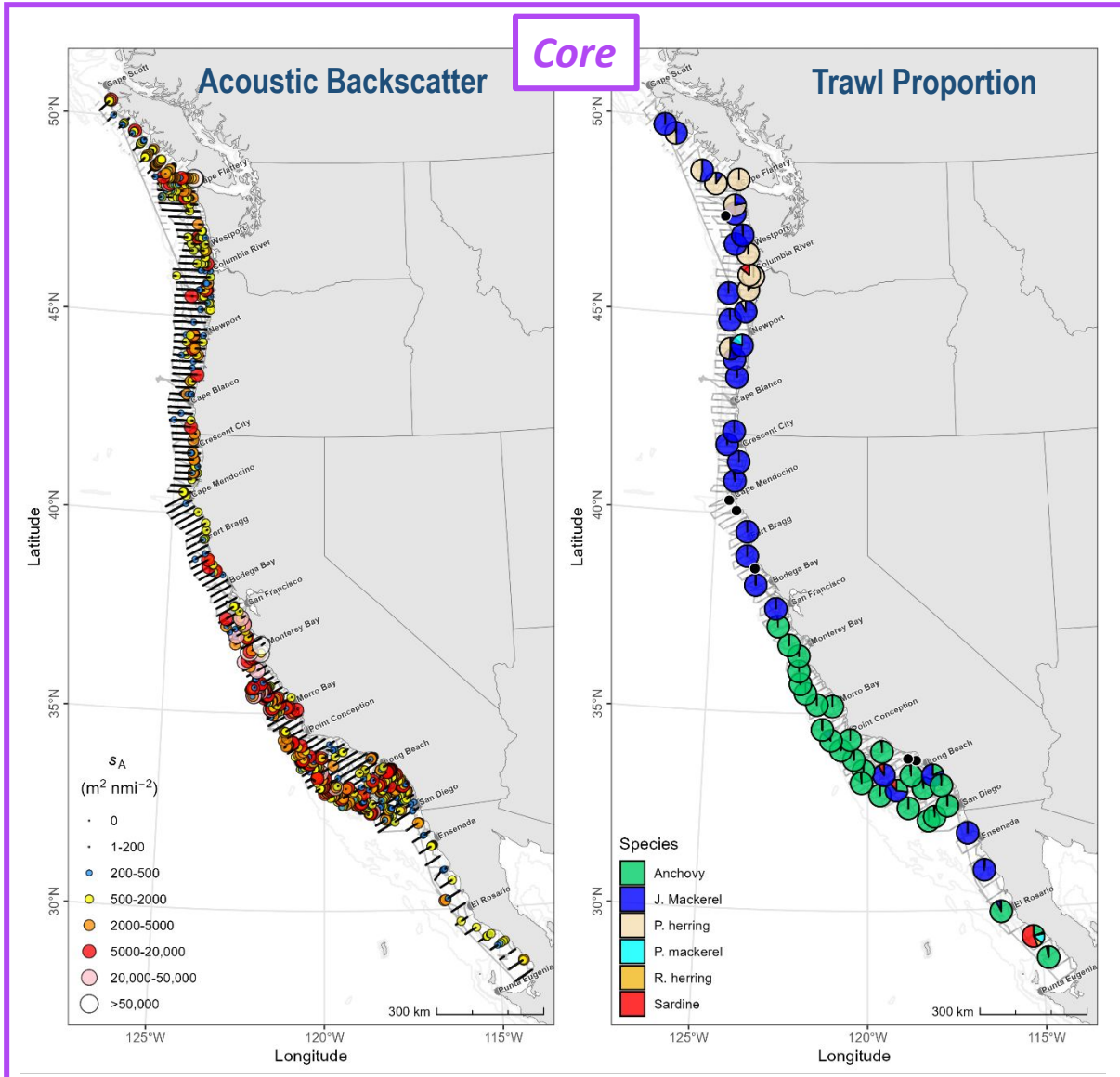


Schematic courtesy of Sabrina Beyer (NWFSC-FEAT)

Backscatter and Catch Proportions



Backscatter and Catch Proportions

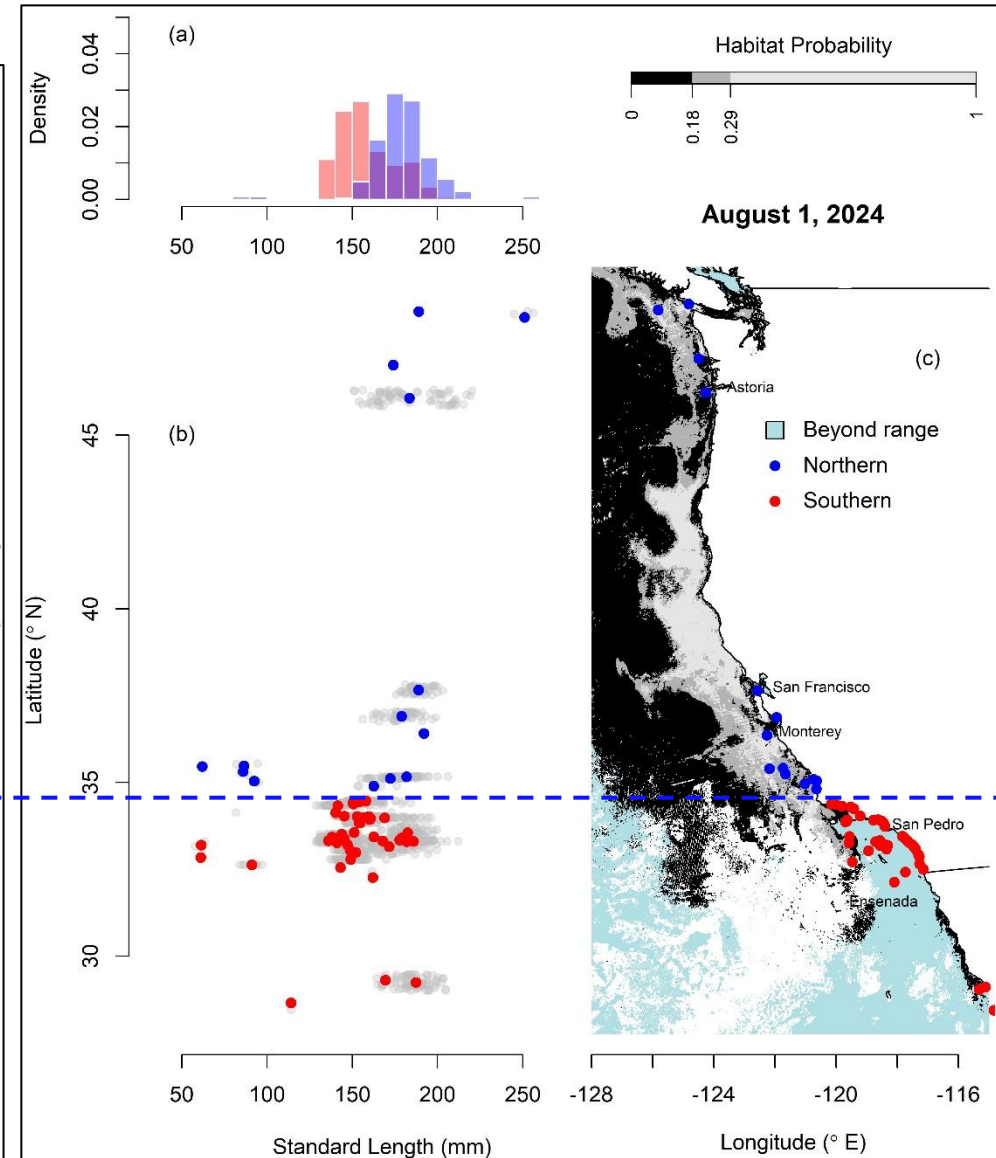
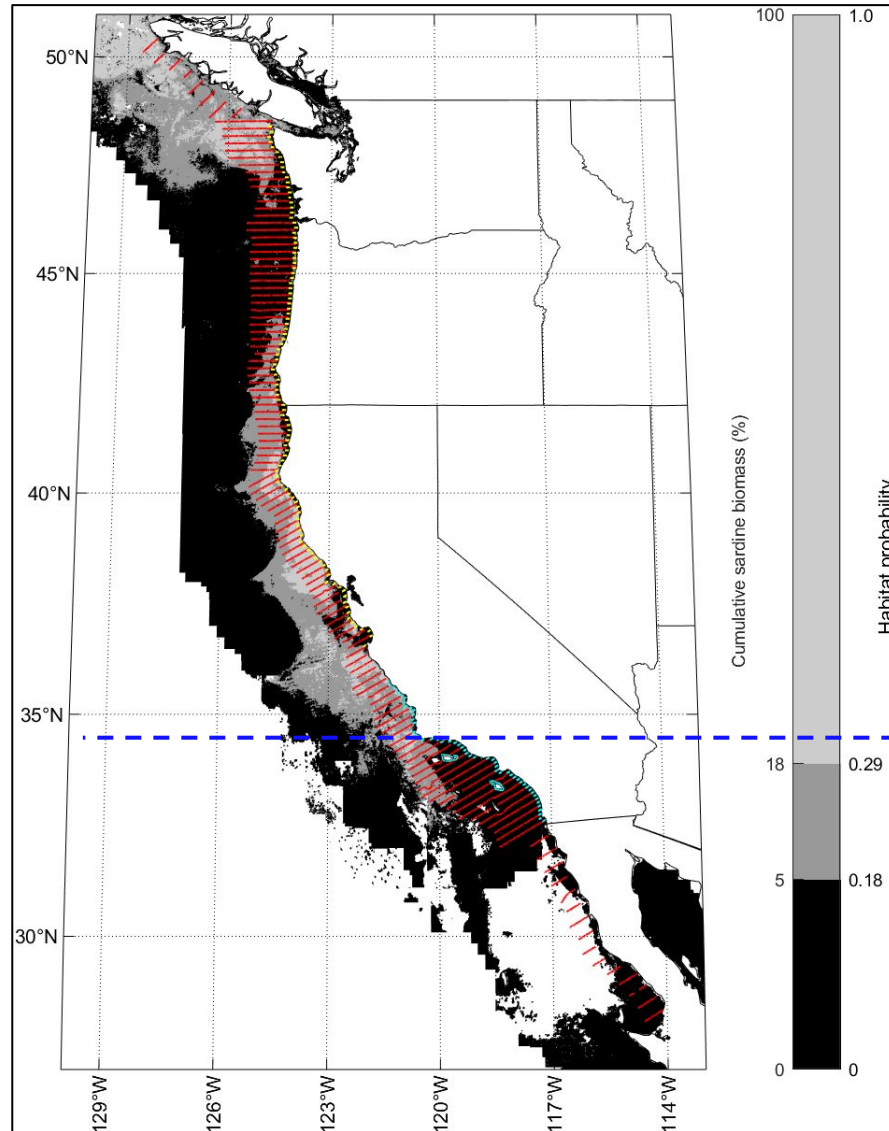


Assignment of P. Sardine Biomass to NSP

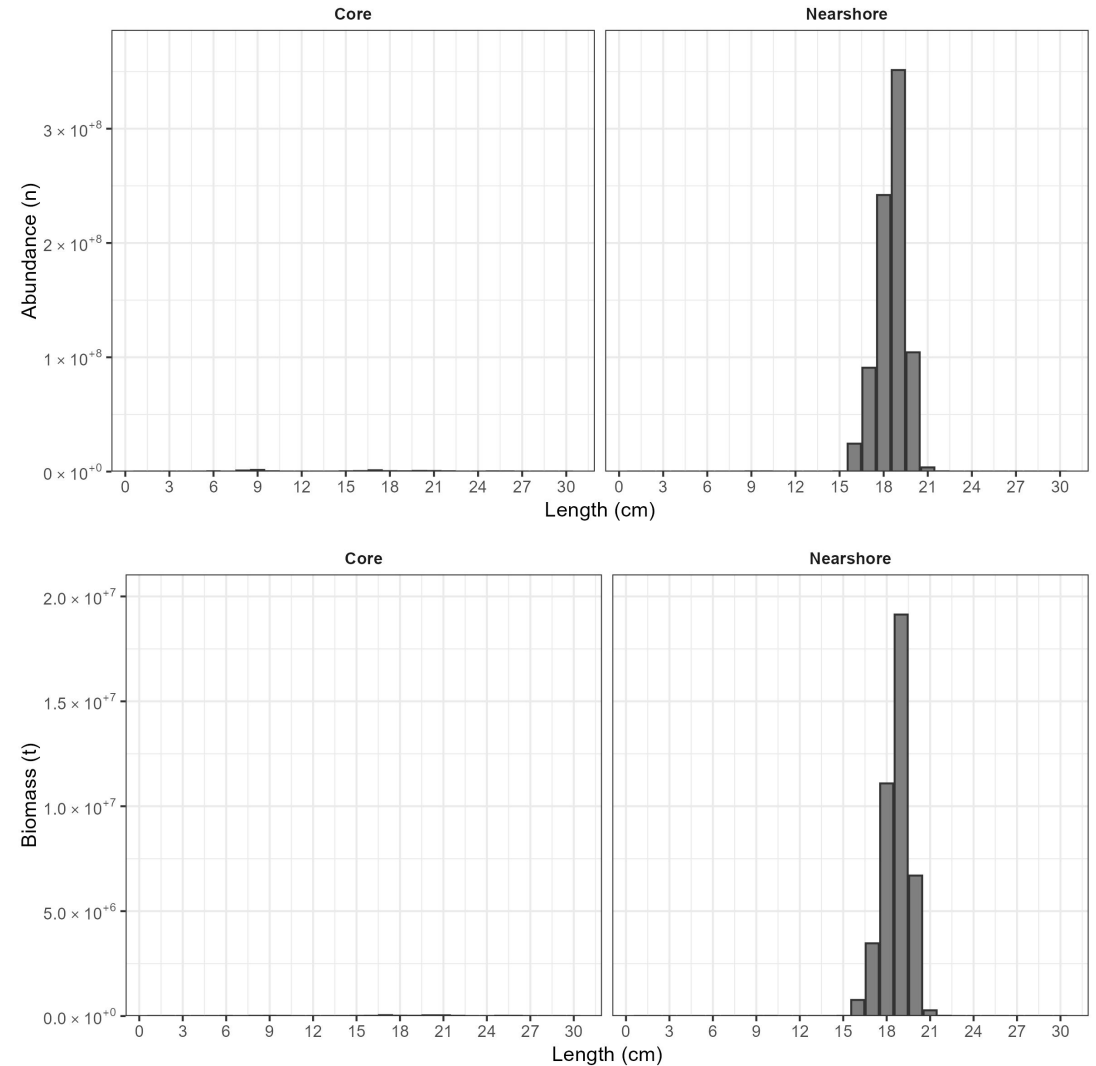
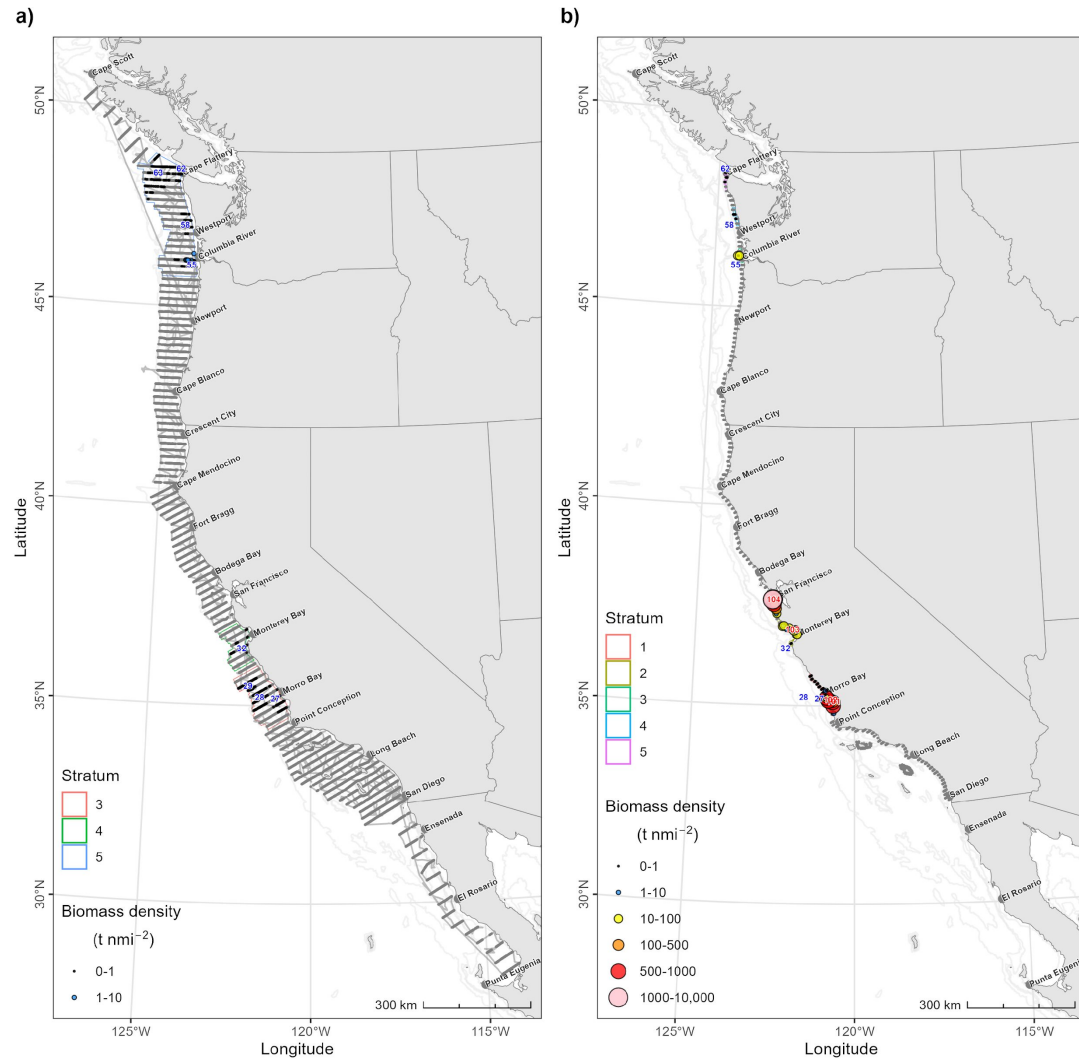
Composite Potential Habitat

- Revised habitat-model, averaged in areas $\pm 2^\circ$ latitude and longitude, centered around the daytime location of each vessel throughout the survey
- Trawl clusters in contiguous areas with habitat probability < 0.18 assigned to southern subpopulation (SSP)
- In 2024, this habitat break corresponded with Pt. Conception
- Individual (gray) and mean lengths of P. Sardine in each trawl cluster appear different north (blue) and south (red) of this latitude
- Japanese Sardine in the samples are being treated as Pacific Sardine*

*See upcoming talk by M. Craig.



NS P. Sardine | Biomass and length distribution



P. Sardine | NSP - Biomass

| | | | Stratum | | | Trawl | | Biomass | | | |
|------------------------|---------------|------------|---------------|-----------|--------------|-----------|--------------|---------------|---------------|----------------|-----------|
| Species | Subpopulation | Region | Area | Transects | Distance | Clusters | Individuals | Mean | CI (Lower) | CI (Upper) | CV |
| <i>Sardinops sagax</i> | Northern | Core | 14,530 | 33 | 1,456 | 8 | 632 | 337 | 64 | 892 | 69 |
| | | Nearshore | 808 | 37 | 141 | 10 | 801 | 77,412 | 21,736 | 155,856 | 45 |
| | | All | 15,338 | 70 | 1,597 | 18 | 1,433 | 77,750 | 21,800 | 156,748 | 45 |

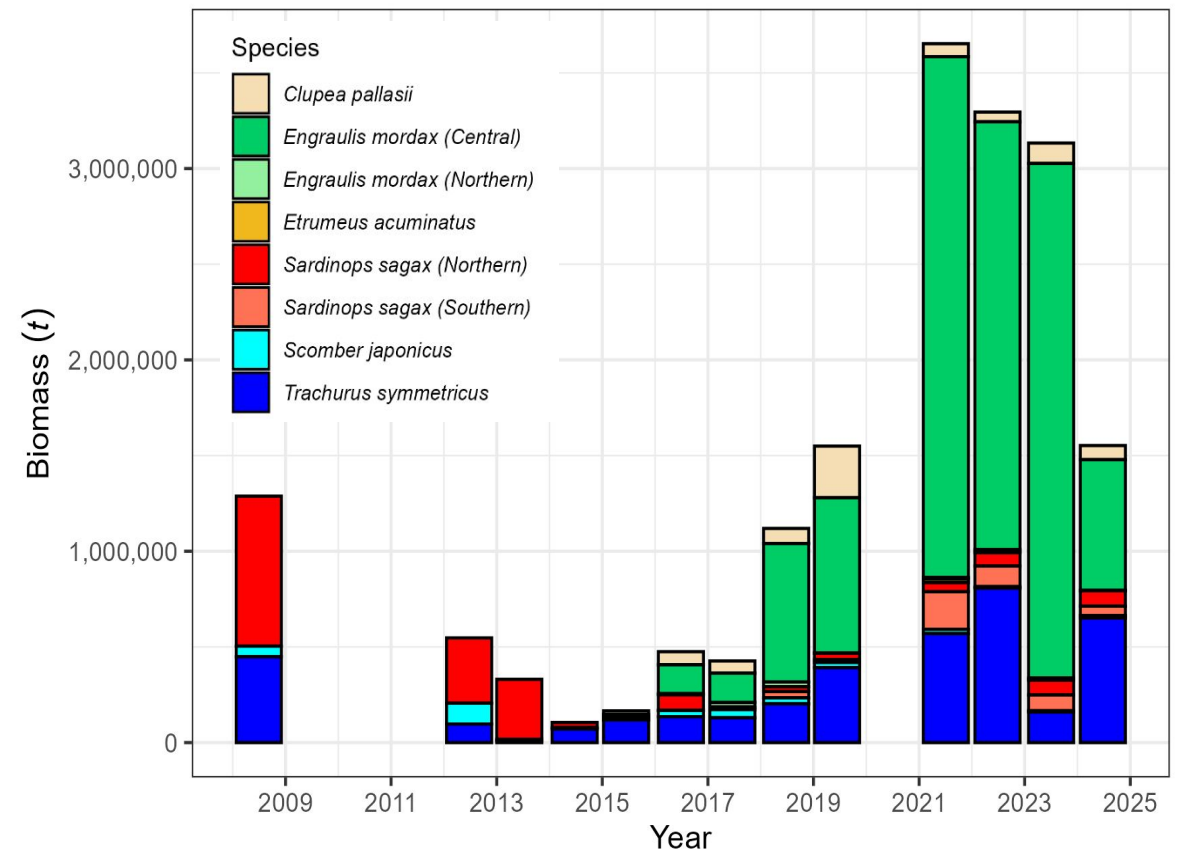
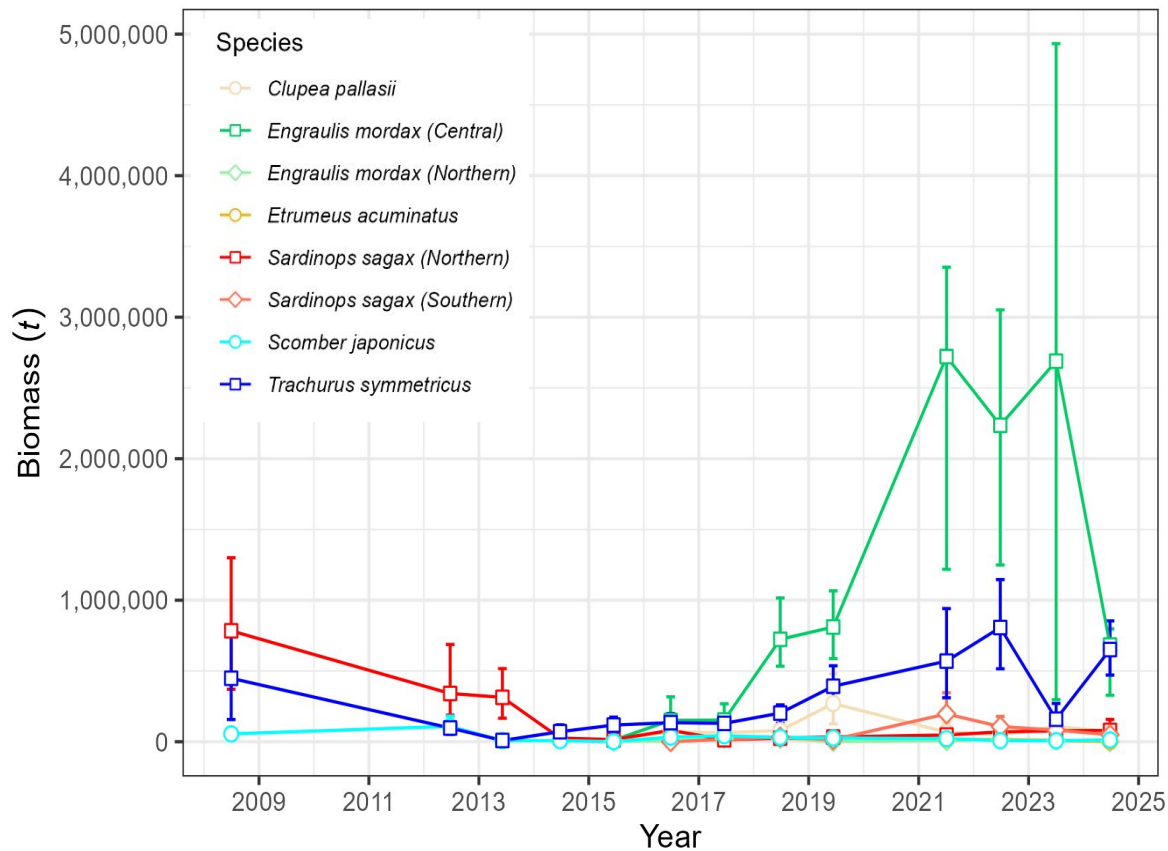
All CPS | Summary (Core + Nearshore)

| | | | Stratum | | | Trawl | | Biomass | | | |
|------------------------------|---------------|--------|---------------|-----------|--------------|-----------|--------------|----------------|---------------|----------------|-----------|
| Species | Subpopulation | Region | Area | Transects | Distance | Clusters | Individuals | Mean | CI (Lower) | CI (Upper) | CV |
| <i>Clupea pallasii</i> | All | All | 22,217 | 111 | 2,186 | 31 | 55,901 | 69,923 | 37,912 | 109,595 | 21 |
| <i>Engraulis mordax</i> * | Central* | All | 30,577 | 108 | 2,825 | 41 | 1,600,074 | 682,657 | 328,527 | 796,114 | 17 |
| | Northern | All | 7,086 | 28 | 712 | 6 | 155 | 151 | 21 | 289 | 40 |
| <i>Etrumeus acuminatus</i> | All | All | 9,203 | 26 | 754 | 5 | 156 | 1,837 | 276 | 3,952 | 42 |
| <i>Sardinops sagax</i> | Northern | All | 15,338 | 70 | 1,597 | 18 | 1,433 | 77,750 | 21,800 | 156,748 | 45 |
| | Southern | All | 16,395 | 91 | 1,561 | 39 | 4,131 | 47,566 | 32,397 | 96,235 | 25 |
| <i>Scomber japonicus</i> | All | All | 28,753 | 119 | 2,771 | 41 | 1,495 | 11,129 | 4,950 | 19,241 | 24 |
| <i>Trachurus symmetricus</i> | All | All | 62,363 | 265 | 5,965 | 80 | 21,378 | 618,467 | 446,095 | 804,715 | 12 |

*Results for the central subpopulation of N. Anchovy subject to change

All CPS | Community Biomass Time Series

- The biomass of the NSP of Pacific Sardine (77,750 t) was virtually unchanged from the 77,252 t estimated in summer 2023 (Stierhoff et al. 2024).
 - Note: these estimates conflate the presence of *Sardinops melanostictus* (Longo et al., 2025), which may result in subsequent revisions.
- In 2024, the biomass was observed almost entirely in the nearshore region near Pt. Conception and between Santa Cruz and San Francisco, and somewhat coincident with observations from the CDFW aerial survey.
- In contrast, in 2023, NSP biomass was mostly observed in the core and nearshore regions between Cape Blanco, OR and Cape Flattery.



Longo et al. (In review) Update on the presence of Japanese Sardine (*Sardinops melanosticta*) in the California Current Large Marine Ecosystem 2024. NOAA-SWFSC-TM.

Questions?