



NOAA
FISHERIES
Southwest Fisheries
Science Center

NMFS Report SWFSC Activities Highly Migratory Species

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Presentation Outline

1. 71st Tuna Conference
2. Tuna ID Guide
3. Albacore Habitat Prediction
4. Bluefin Tuna Size Composition Sampling
5. Albacore Genetic Sex Marker
6. Incorporating HMS Diet Data
7. HMS Stock Assessments
8. Management Strategy Evaluation
9. Minimizing Impacts to Research During the Pandemic



71st Tuna Conference

Virtual Event: May 18-20, 2021



- The theme for this year's Tuna Conference will be: Using new technologies to update and validate life history studies: The times they are a changin'
- We plan to return to hosting the conference in the beautiful mountains of Lake Arrowhead in 2022!
- To register please visit the weblink

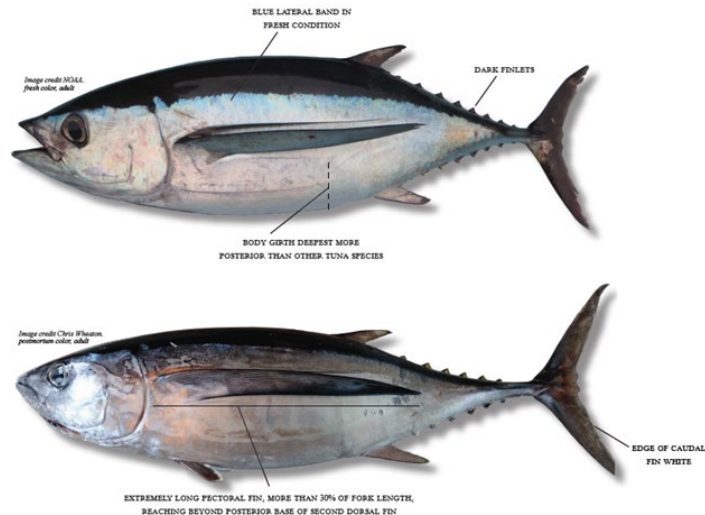


<https://www.tunaconference.org/>



Tuna Species of the U.S. West Coast: A Photographic Identification Guide

- Created for recreational anglers, the general public, and citizen scientists
- Lists the external features, ecological preferences, and behaviors of each species
- Tuna species encountered in California, Oregon, and Washington
- Distributed to local sportfishing boats and shops

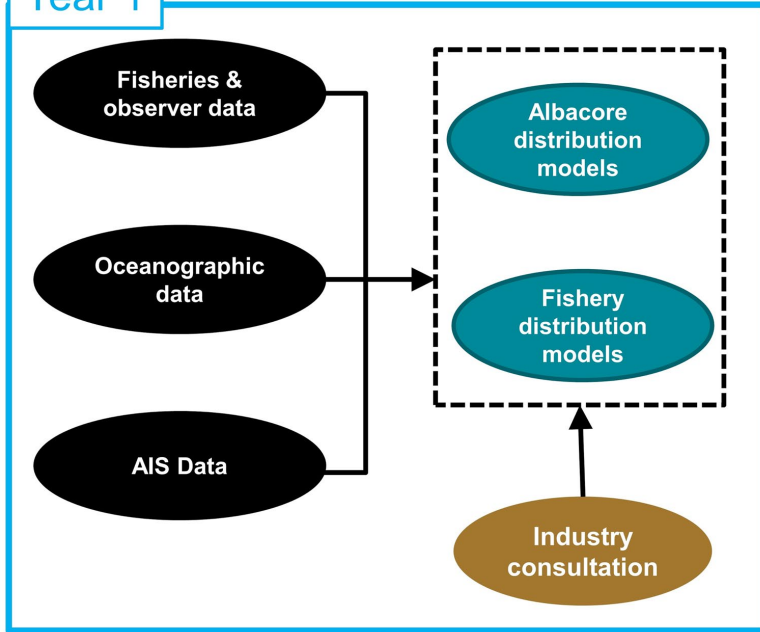


<https://repository.library.noaa.gov/view/noaa/23154>

Dynamic Decision Support Tools to Counter IUU Fishing

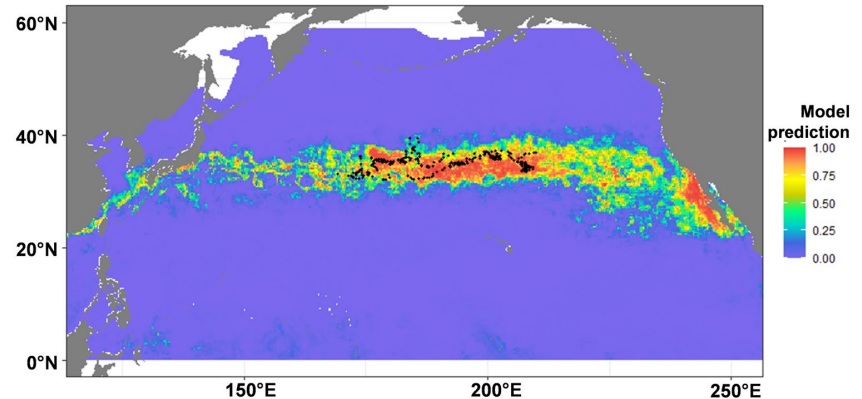
Focus on North Pacific Albacore

Year 1



- Year 1 tasks in progress:
 - Build albacore distribution models using fishery-dependent data
 - Build fishing effort models using AIS data
 - Commence stakeholder outreach

Predictive model for juvenile albacore: February 2012



Funding: NOAA Office of Law Enforcement

Other collaborators: Tim Frawley, Mike Jacox, Elliott Hazen, Steph Brodie, Heather Welch, James Smith, Steven Bograd, Megan Cimino, Hannah Blondin, Tim White, Heidi Dewar

Bluefin Tuna Size Composition Sampling

- Sample Bluefin lengths from recreational vessels in San Diego, CA
 - NOAA port sampling (2014 - 2019)
 - Sportfishing Association of California (SAC) at-sea sampling (2015 - 2020)
- Both programs combined sampled 8,606 lengths $\approx 7.0\%$ of total CA catches
- Ongoing comparison of length compositions to inform the bluefin tuna stock assessment

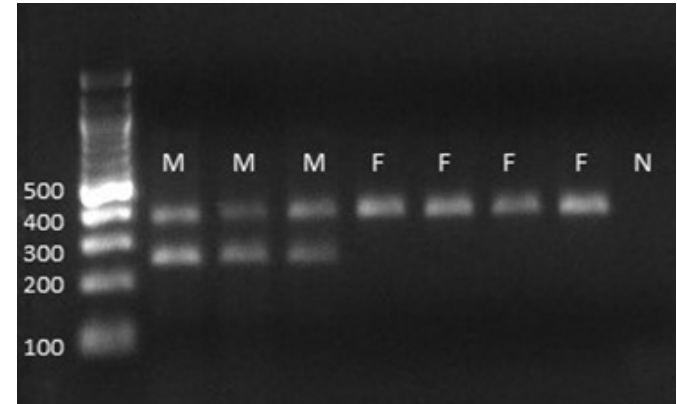


James, K.C., Heberer, L., and Dewar, H. (*in prep*) Comparison of Pacific Bluefin Tuna Length Sampling Programs: 2014-2020. NOAA Technical Memo

PCR-Based Albacore Genetic Sex Marker



- Sex ratio is needed for stock assessment, but may vary by region or age/size of fish
- Determining sex typically requires invasive/lethal sampling
- Genetic techniques requiring a non-lethal tissue sample (fin clip) would accelerate ability to determine sex ratio and enhance stock assessment
- Compare histologically confirmed sex to a PCR-based assay



PCR bands showing male and female pattern for three-primer PCR sex determination assay described herein. M = male, F = female, N = no-template negative control.

Incorporating HMS Diet Data

- Incorporate diet data from Pacific bluefin tuna, swordfish, and albacore tuna into CalCOFI/ Integrated Ecosystem Assessments (IEA) ~ Ecosystem based management
- Deliverables: Inclusion in the 2021 CalCOFI Report: Status of the California Current in 2020
- Link diet data to fluctuations in availability of Coastal Pelagic forage species and oceanography
- Stomachs collected: Pacific bluefin tuna, swordfish, and albacore tuna from the California Current: 2007 - 2020



Swordfish Diet (Preti 2020)

- California Current during 2007-2014
- 292 stomachs sampled from DGN contained 60 prey taxa
- Diet switched by year - varied with swordfish size and sub-areas

Importance of first 6 prey items ranked by GII (Geometric Index of Importance)

| Prey Taxon | %Number | %Frequency | %GII |
|-------------------|---------|------------|-------|
| Jumbo squid | 20.23 | 59.25 | 44.25 |
| Gonatopsis squid | 16.86 | 62.33 | 29.08 |
| Abraliopsis squid | 8.85 | 40.07 | 16.31 |
| Gonatus squid | 5.70 | 37.67 | 14.48 |
| Market squid | 10.26 | 30.14 | 13.66 |
| Pacific hake | 6.31 | 16.78 | 12.59 |

HMS Stock Assessments - ISC

2021

- Pacific Blue Marlin (Benchmark Assessment)
- US will host ISC 2021 Plenary Meeting in Kona, HI
 - July 2021 (~COVID-19 situation dependent)

2022

- Pacific Bluefin Tuna (Update Assessment)
- North Pacific Swordfish (Benchmark Assessment)
- North Pacific Blue Shark (Benchmark Assessment)



HMS Stock Assessments - IATTC

2021

- Swordfish, South EPO (Benchmark Assessment)
- Bigeye Tuna (Indicator Analysis)
- Yellowfin Tuna (Indicator Analysis)
- Skipjack Tuna (Indicator Analysis)
- Silky Shark (Indicator Analysis)

2022

- South Pacific Albacore Tuna (Benchmark Assessment)
- Bigeye Tuna, Pacific-wide (Exploratory Analysis in Collaboration with SPC)
- Bigeye Tuna (Indicator Analysis/Exploratory Assessment)
- Yellowfin Tuna (Indicator Analysis/Exploratory Assessment)
- Skipjack Tuna (Indicator Analysis/Exploratory Assessment)
- Silky Shark (Indicator Analysis)



Management Strategy Evaluation (MSE)

- North Pacific Albacore MSE Workshop for Managers and Stakeholders
 - Hosted by ISC ALBWG
 - ISC ALBWG has completed the modeling for the North Pacific Albacore MSE
 - Joint virtual workshop for US & Canada during March 22 - 25, 2021
 - Objective of workshop is to help managers and stakeholders understand the preliminary results of the MSE
- EPO Tropical Tuna MSE Workshop
 - Hosted by IATTC
 - Virtual workshop during May 3 - 4, 2021

Minimizing Impacts to Research During the Pandemic

- SWFSC staff brought microscopes home to continue age and growth and reproductive biology studies
- Utilized partnerships with fish processors to continue biosample collections
 - Pacific Bluefin tuna
 - Albacore
- Fisheries observers delivered biosamples to temporary freezers at homes of SWFSC staff
 - Swordfish
 - Sharks



Thank you Questions?

