

2015-2017 PIER Deep-Set Buoy Gear EFP Summary-June, 2018

2015-2017 EFP findings

Ongoing and proposed research

Chugey Sepulveda, PhD
Scott Aalbers, M.S.



Outline

- Background
- DSBG
- PIER DSBG EFP progress and findings
- Research update

PIER Goals

Provide data for better management and increase domestic opportunity for suppressed fishing communities

PIER Deep-set Buoy Gear (DSBG)

Designed for the west coast
based on regional,
species-specific data



Rapid sink rate

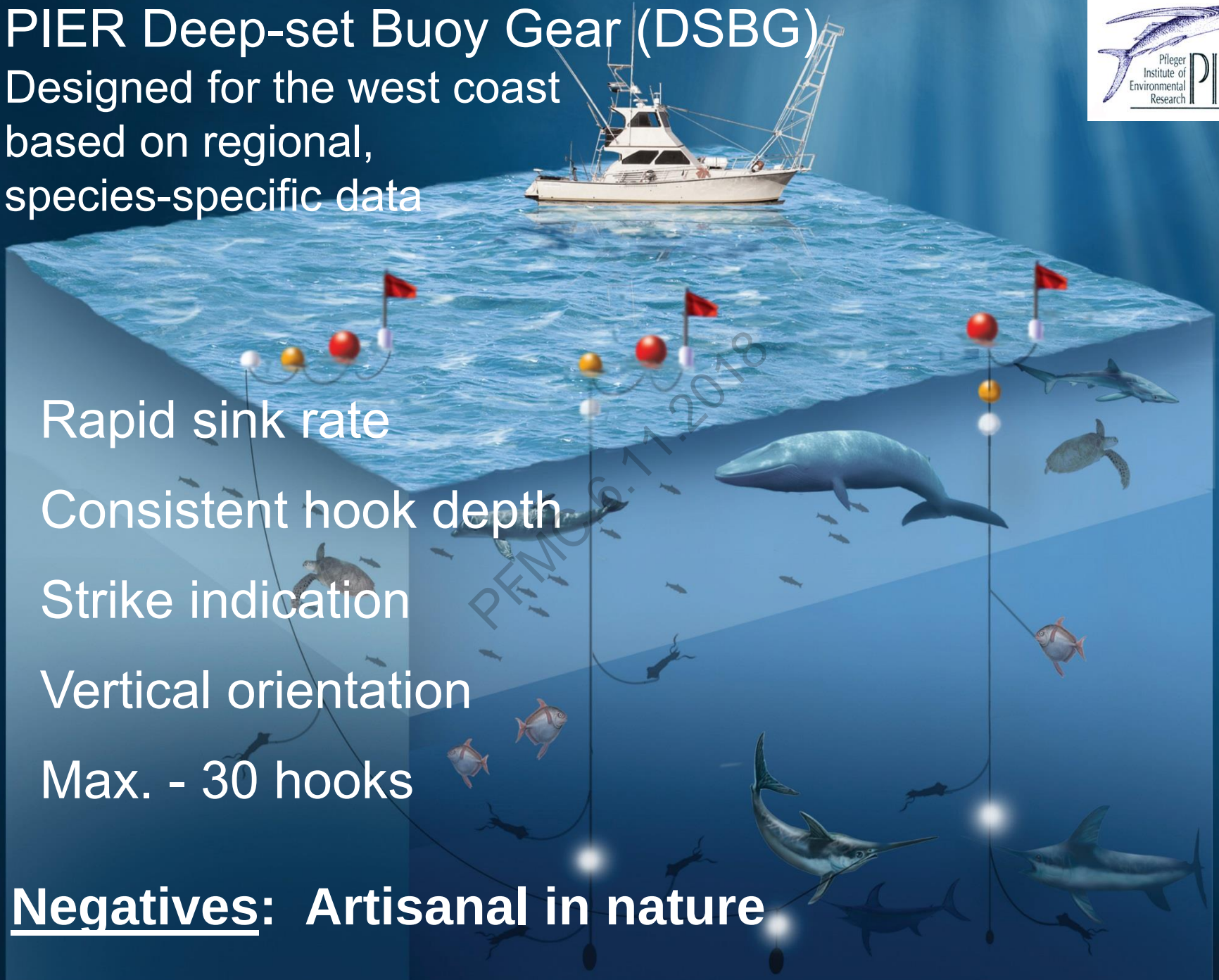
Consistent hook depth

Strike indication

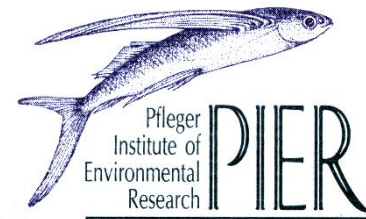
Vertical orientation

Max. - 30 hooks

Negatives: Artisanal in nature



Exempted Testing



Exempted trials were used to test DSBG:

Gear Selectivity

Seasonal catch performance

Economic viability

Fisher interest

PIER DSBG-EFP only used swordfish fisherman with SCB experience

Selection rubric to choose 5 cooperative fishers

We petitioned for 30% coverage based on:

1. PIER oversight
2. Daily check-in procedure
3. Logbook and observer record validation procedures

Collective EFP Observation Rate of 38%
(range from 36 to 49%)

PIER-DSBG-EFP



Vessel Sizes (~38-55')

Avg. trip duration 3.9d

Avg. # hooks/set ~10

Trip characteristics

Late summer and fall

Capitalize on local market trends



PIER-DSBG-EFP



3 consecutive seasons (June-January)

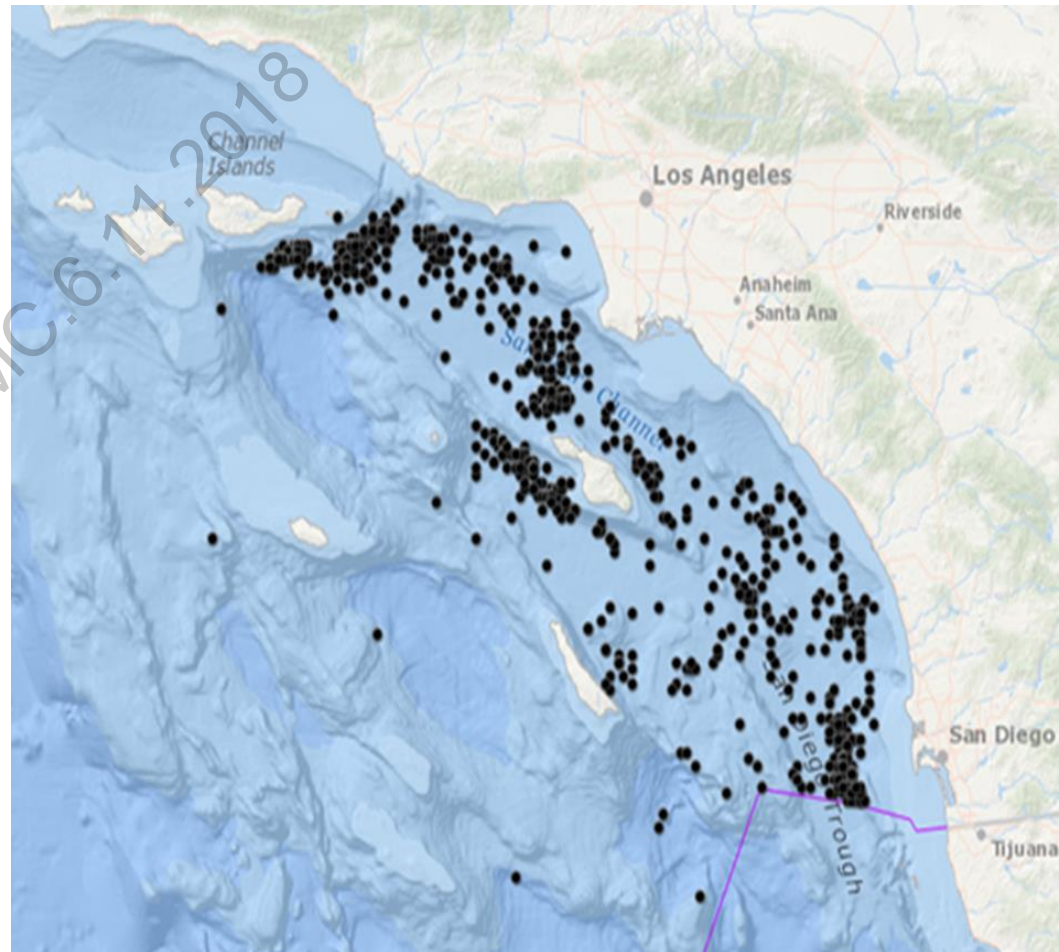
El Nino & Non-El Nino years

sets made **743 in EFP**
(>950 including research)

buoys deployed in EFP
>7,300
(>9,000 including research)

of pieces lost all sets (1)

Distribution of Effort
highly patchy



PIER EFP Catch Rates

Standardized to an 8-hr Fishing Day (2015-2017)



**2015 range from 0.6 to 1.6 SF/8hr
(avg. ~1.3)**

**2016 range from 1.3 to 2.9 SF/8hr
(avg. ~1.9)**

**2017 range from 1.2 to 2.69 SF/8hr
(avg. ~1.9)**



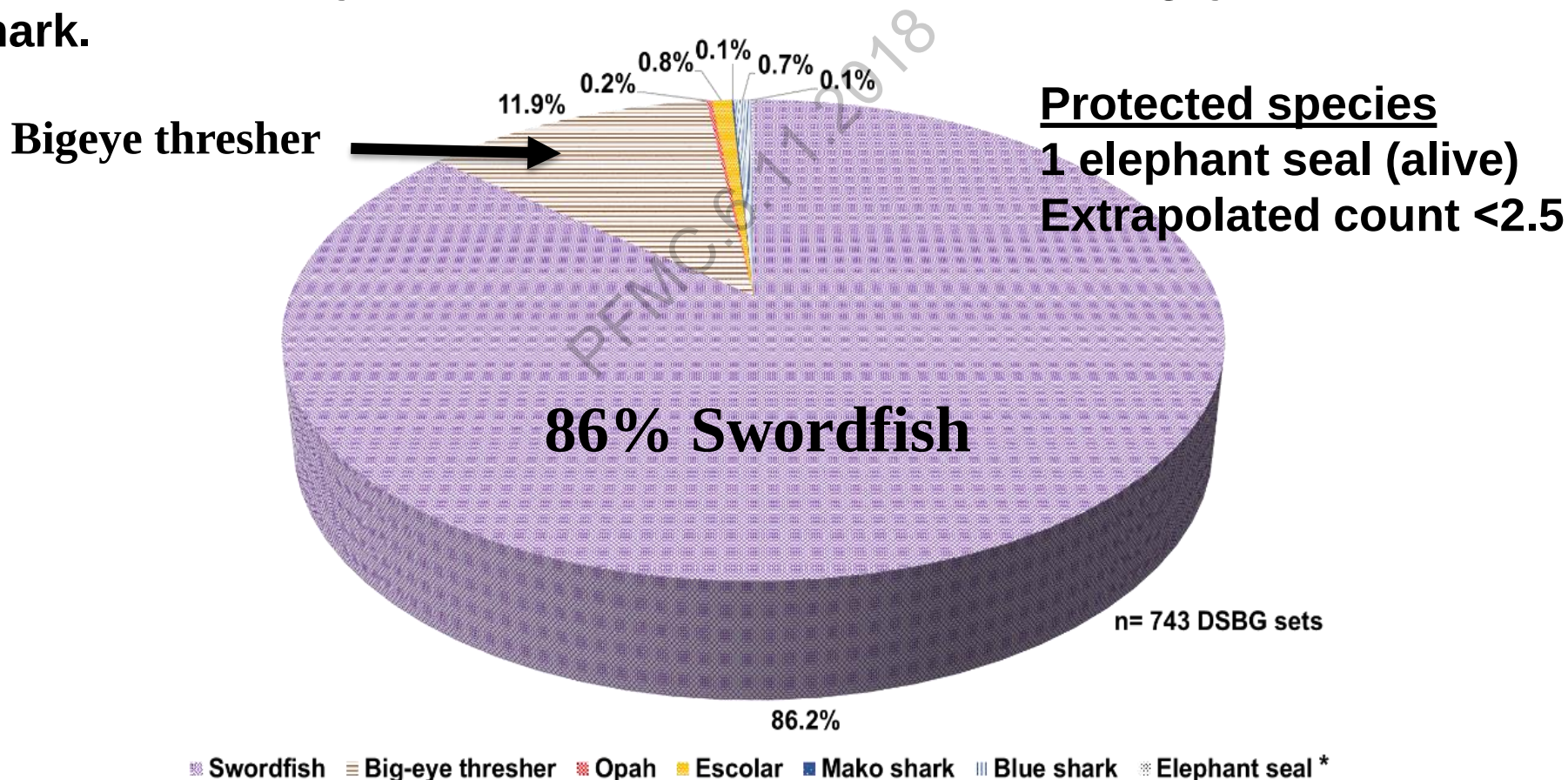
2015-2017 multi-season average 1.8 SF/8hr set

**2015-2017 multi-season average 1.57 SF/fishing
day (non-standardized)**

EFP Catch Composition (2015-2017)

EFP Year	SF	other marketable	non-marketable
2015	65%	33%	~2%
2016	88%	11%	~ 1%
2017	93%	6%	<1%

2015-2017 DSBG yielded ~86% swordfish and ~ 12% bigeye thresher shark.



Market Outreach and Dynamics

- Avg. market price of ~\$7/lb.
(range ~\$4-13)

- Traceability tags

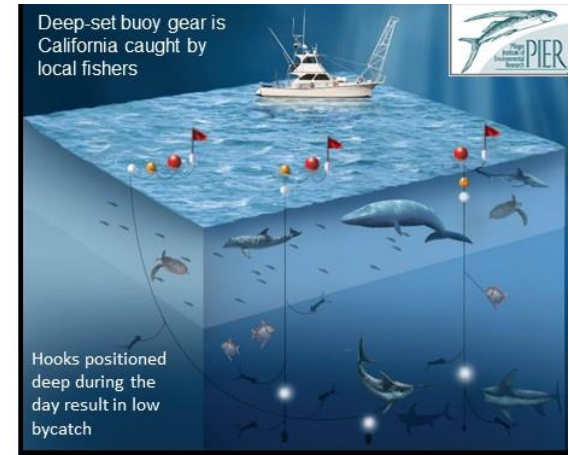
- Effort trends

- Market Price
- DGN
- Foreign product



Track Your Catch

Deep-set Buoy Gear (DSBG) is a low-impact fishing method that was designed for the West Coast. By setting hooks deep during the day, fishers are able to selectively target swordfish and avoid sensitive bycatch, like sea turtles and whales.



Deep-set swordfish is among the highest quality product on the market. It is caught at extremely cold temperatures and brought to market within days of capture. High quality coupled with environmental stewardship comes at a cost, so please support your local fishing community and buy local seafood.



Low impact methods like DSBG allow U.S. fishers to harvest healthy stocks one swordfish one at a time.



To ensure consumers receive the product that they deserve, each deep-set swordfish is tagged with a traceability label that allows buyers and consumers to track down which vessel landed the fish.

Research Only



Nocturnal shallow-set trials
(FNA14NMF4270053)

Linked buoy gear research
(NA13NMF4720272; FNA15NMF42720380; TNC)

Bigeye thresher survivorship
(NA16NMF47220371; Pew Charitable Trust)

Swordfish stock structure-tagging and genetic assessment
(FNA16NMF4270257; TNC)

Smart buoy development (NA17NMF4720257; TNC)

Nocturnal Trials

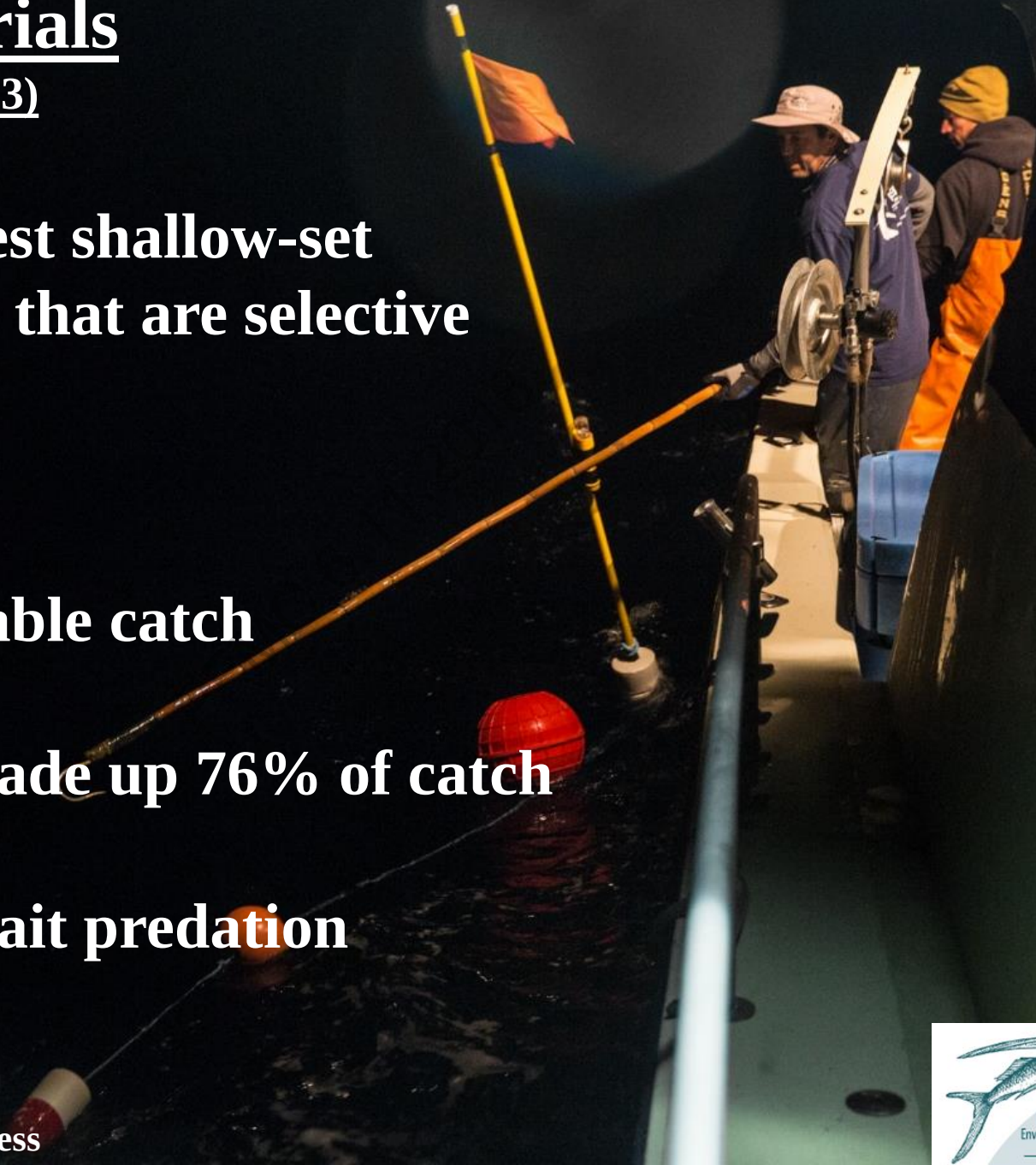
(FNA14NMF4270053)

**Develop and test shallow-set
configurations that are selective
for swordfish**

~20% marketable catch

~blue shark made up 76% of catch

high rates of bait predation



Linked Buoy Gear Research

(NA13NMF4720272; FNA15NMF42720380, TNC)



- 1. Design and test LBG**
- 2. Configure to be compatible with DSBG**
- 3. Test under exempted status**

Conform:

Strike detection
Serviceability
Hook type
Depths fished
Time of day
of hooks



Swordfish caught using Linked Buoy Gear were outfitted with electronic tags to assess stock structure (#FNA16NMF4270257)

PIER Linked Buoy Gear



Attributes that distinguish PIER Linked Buoy Gear (NA15NMF4720380) from traditional longline

	PIER LBG	Traditional SS longline
Horizontal footprint	3 to 5 nm	40-60 nm
Hook count	30	800-1,000+
Tending	Active tending	Overnight soak / no tending
Hook depth	Below 250m	Surface waters
Time of set	Day	Night
Strike detection	Yes	No
Serviceability	Yes	No
Weighted vertical legs	Yes	No

PIER Linked Buoy Gear LBG



Rapid sink rate

Consistent hook depth

Strike indication

Vertical orientation

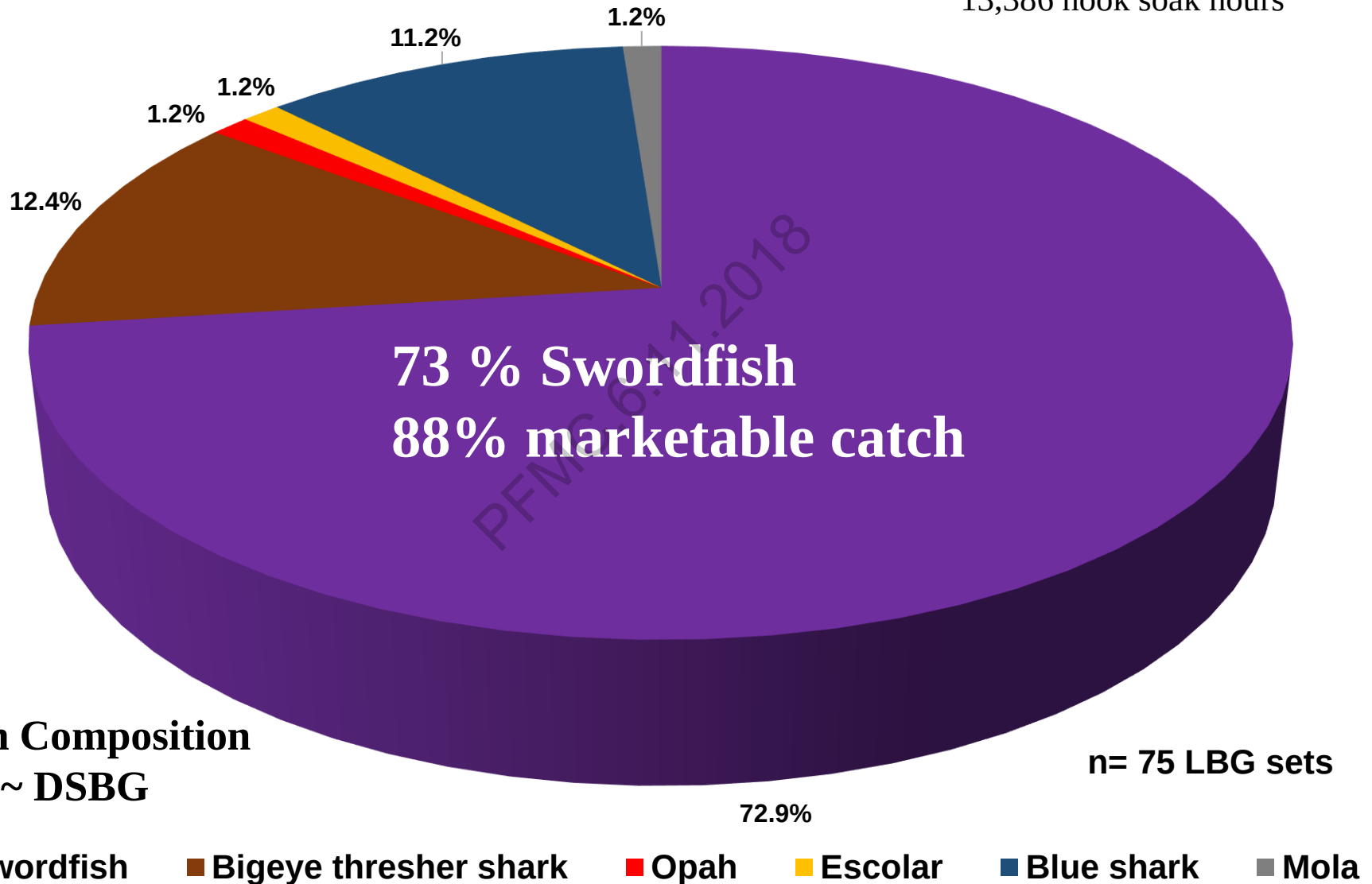
3.7nm in length

Hook count (Max. - 30 hooks)



PIER Linked Buoy Gear Research Catch Composition

13,386 hook soak hours



Linked Buoy Gear Exempted Trials

(NA17NMF4270216, TNC)

- Funding in hand to initiate trials
- Importance of a full season
- Fishers are on hold

Need for linked option

- PLCA
- Offshore Conditions
- Accommodation for larger vessels



Assessing SCB migration patterns and Stock Structure

(FNA16NMF4270257)

Tag swordfish caught during research trials

Couple tagging & genetics data to assess swordfish migration corridors, spawning areas and stock structure

Use multiple tags/fish to assess annual migration patterns

Sample each fish and assess genetic differences using SNP's.

(Alvarado-Bremer Laboratory)



Stock Structure

North Pacific Swordfish

2-Stock Hypothesis

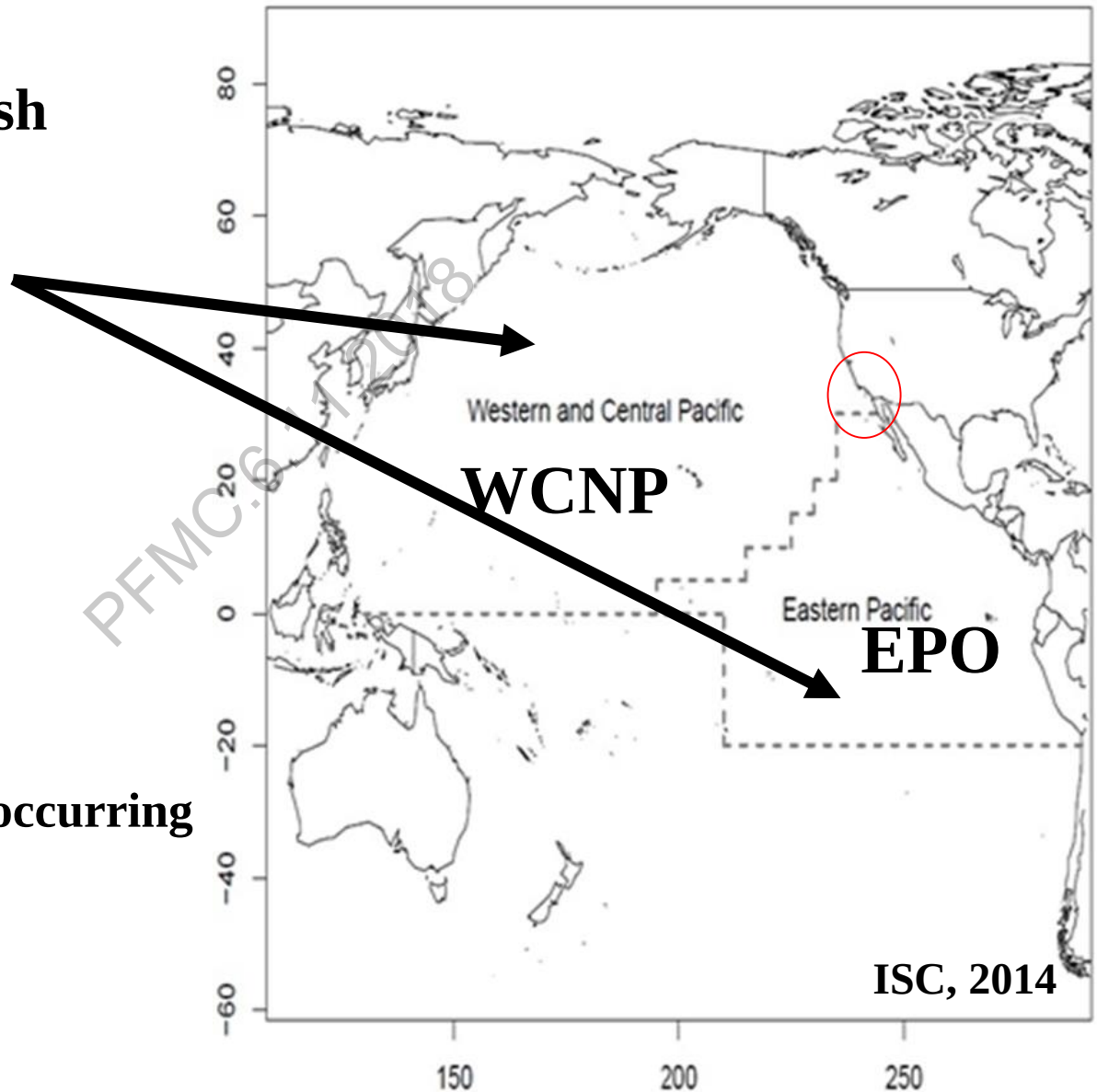
ISC and IATTC

CA Swordfish

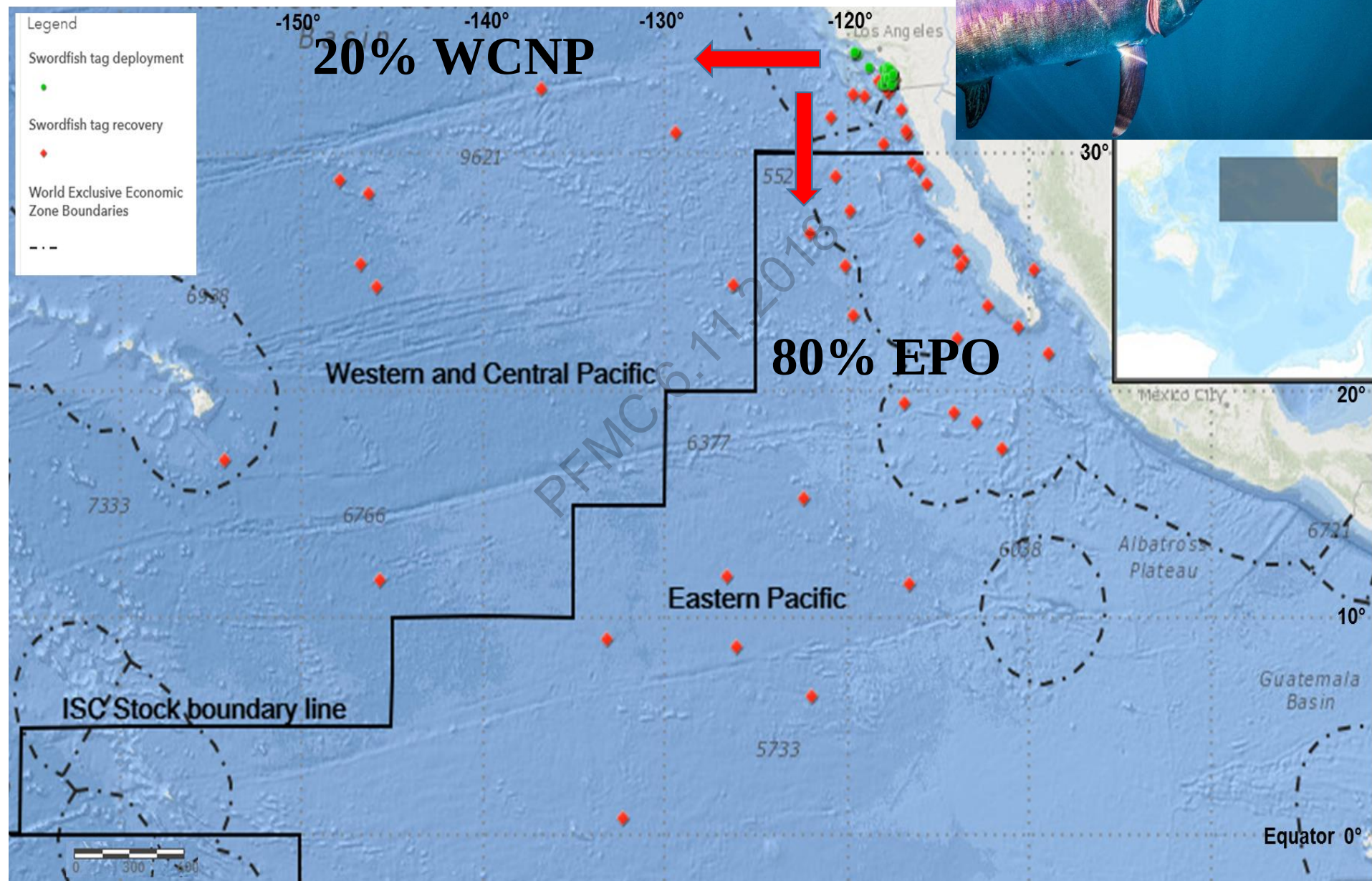
WCNP Stock

EPO Stock

2016-Overfishing is likely occurring



Southern California deployment and pop-off locations



Swordfish Tagging and Stock Affiliation

Findings to date:

- ~111 swordfish tagged in SCB (2014- 2017)
~80% EPO
- 16 tagged in PLCA
~94% WCNP

Preliminary data suggest
high level of connectivity
between SCB and EPO stock.

Management implications
Biological consideration for
permitting



Next Steps

PIER will continue to improve upon the gear designs, better understand stock structure and strive to fill needed data gaps.

EFP's are an important tool for testing new concepts and techniques.

We hope the Council will carefully consider the:

- **Biological, social and economic factors**
- **Past performance history of open-access fisheries**
- **Potential impacts to California's existing swordfish fleet**
- **Historical perspectives and lessons from the 1980's**





Acknowledgements & Support



NOAA

**Saltonstall-Kennedy Grant Program
Cooperative Fisheries Grant Program
Southwest Fisheries Science Center
Bycatch Reduction and Engineering Program**

**George T. Pflieger Foundation
Pew Charitable Trust
The Nature Conservancy
Santa Monica Seafood
California Fisheries Research Program
NOAA WCR & CA DFW
HMS MT and HMSAS**

Supporting partners and cooperative fishers