

# **PIER Research and EFP Summary Update June, 2019**

**(2015-18) DSBG and (2018) LBG EFP findings**

**Ongoing and proposed research**



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# Update

- DSBG-EFP
- LBG-EFP
- Research updates
  - Bigeye thresher survivorship
  - Swordfish tagging
  - Other ongoing and related studies

## Goals

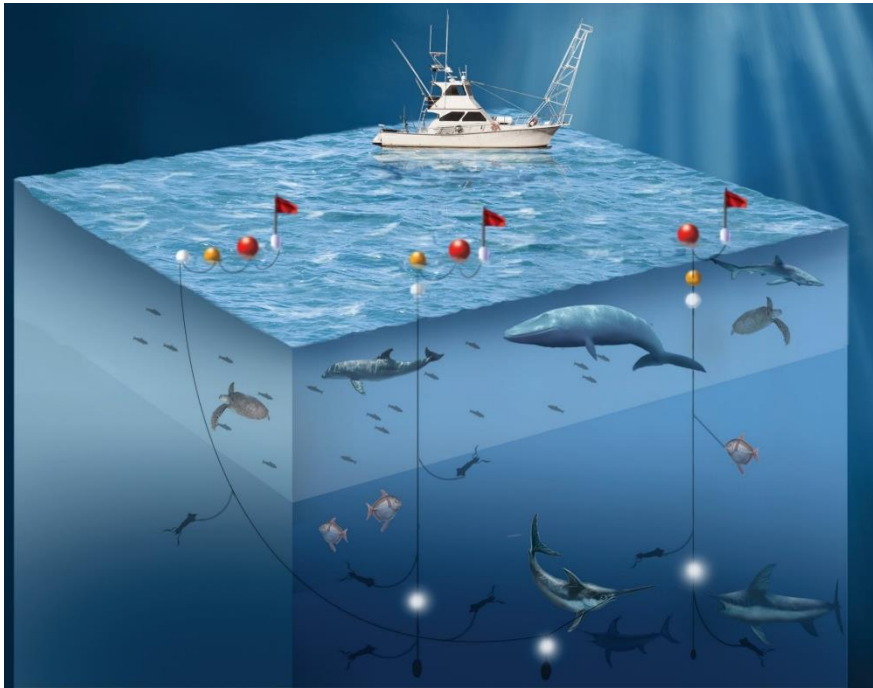
Collect and provide data for better management as well as increase domestic opportunity for suppressed fishing communities

# PIER Deep-set Gear Designs (DSBG and LBG)

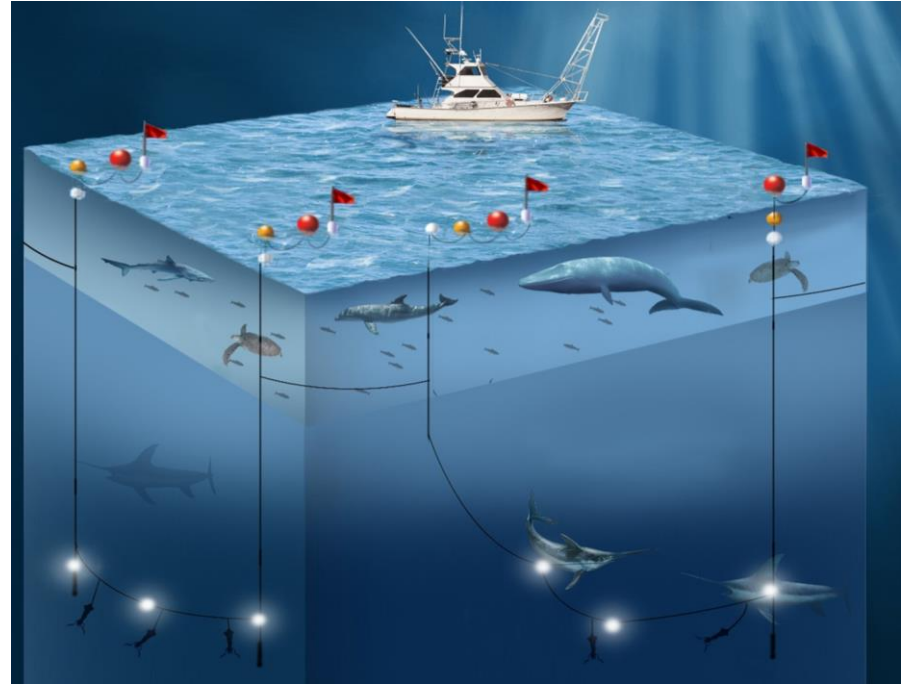
Collaboratively designed for the west coast based on regional, species-specific depth data.

**Primary difference: LBG connects all buoys together & Positions all 30 hooks at SF target depth**

## **DSBG**



## **LBG**





# Exempted Testing



Exempted trials were used to test DSBG and LBG:

Gear Selectivity

Seasonal catch performance

Fisher interest



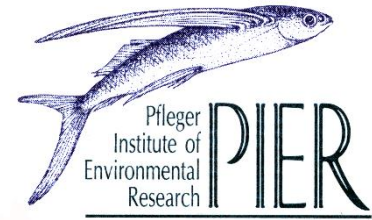
<b><u>PIER EFP</u></b>	<b><u>DSBG</u></b>	<b><u>LBG</u></b>
Seasons	<u>2015-18</u>	<u>2018</u>
Vessels fished	4-5	3
Avg. Trip duration	~4d	~4d
Total sets to date	979 (+140 research)	28 (+95 research)
Total	>1,119	123

Sepulveda et al., 2015; *Marine Fisheries Review*

Sepulveda and Aalbers, 2018; *Marine Fisheries Review*

# Catch Composition:

(Primary parameter for assessing gear selectivity)



<b>DSBG EFP</b>	<b>SF</b>	<b>other marketable</b>	<b>non-marketable</b>
<b>2015</b>	<b>65%</b>	<b>33%</b>	<b>~2%</b>
<b>2016</b>	<b>88%</b>	<b>11%</b>	<b>~ 1%</b>
<b>2017</b>	<b>93%</b>	<b>6%</b>	<b>&lt;1%</b>
<b>2018</b>	<b>91%</b>	<b>7%</b>	<b>~2%</b>

**\*2015-2018 DSBG yielded ~87% swordfish and ~11% bigeye thresher shark.**

<b>LBG EFP</b>	<b>SF</b>	<b>other marketable</b>	<b>non-marketable</b>
<b>2018</b>	<b>~96%</b>	<b>~4%</b>	<b>0%**</b>
<b>Research</b>	<b>~75%</b>	<b>~15%</b>	<b>~9%***</b>

\* Based on 979 sets (9,578 pieces deployed)

\*\* Based on 28 sets (2018)

\*\*\* Based on 95 sets (2015-2018)

**Protected species Interactions**  
**3 elephant seals (released alive)**

# PIER DSBG and LBG EFP SF Catch Rates

Standardized to an 8-hr Fishing Day



## PIER DSBG EFP

Year	Vessels*	Range	Avg.
2015	4	0.6 to 1.6 SF/8hr	~1.3
2016	5	1.3 to 2.9 SF/8hr	~1.9
2017	4	1.2 to 2.7 SF/8hr	~1.9
2018	4	1.0 to 1.6 SF/8hr	~1.3

PIER DSBG EFP 2015-2018 season average ~1.7 SF/8hr set  
multi-season average ~1.5 SF/fishing day (non-standardized)\*\*

## PIER LBG EFP

	CPUE Range	Avg.
2018	0.6-1.6 SF/8hr	~1.3***

## Research only

	Avg. CPUE
2018 season	2.3 SF/8hr

\* # Vessels that fished the entire season

\*\* Based on 979 sets and 1,425 SF

\*\* LBG Fishing did not commence until 10/2019

# Market Dynamics



- Avg. market price was lower in 2018 than past seasons
  - Effort trends
  - DGN
  - Foreign product
  - Traceability tags
  - Market promotion





# Research Only



## **DSBG and LBG Development**

(FNA15NMF42720380; NA17NMF4270216; The Nature Conservancy; OPC 111805971)

## **Bigeye thresher survivorship DSBG and LBG**

(NA16NMF47220371; NA18NMF4720288; Pew Charitable Trust)

## **Swordfish stock structure-tagging and genetic assessment**

(FNA16NMF4270257; TNC; OPC # 111805971)

## **Smart buoy development** (NA17NMF4720257; TNC)

## **Opah tagging and fishery development** (NOAA SWFSC; TNC)



# Nocturnal Trials

(FNA14NMF4270053)

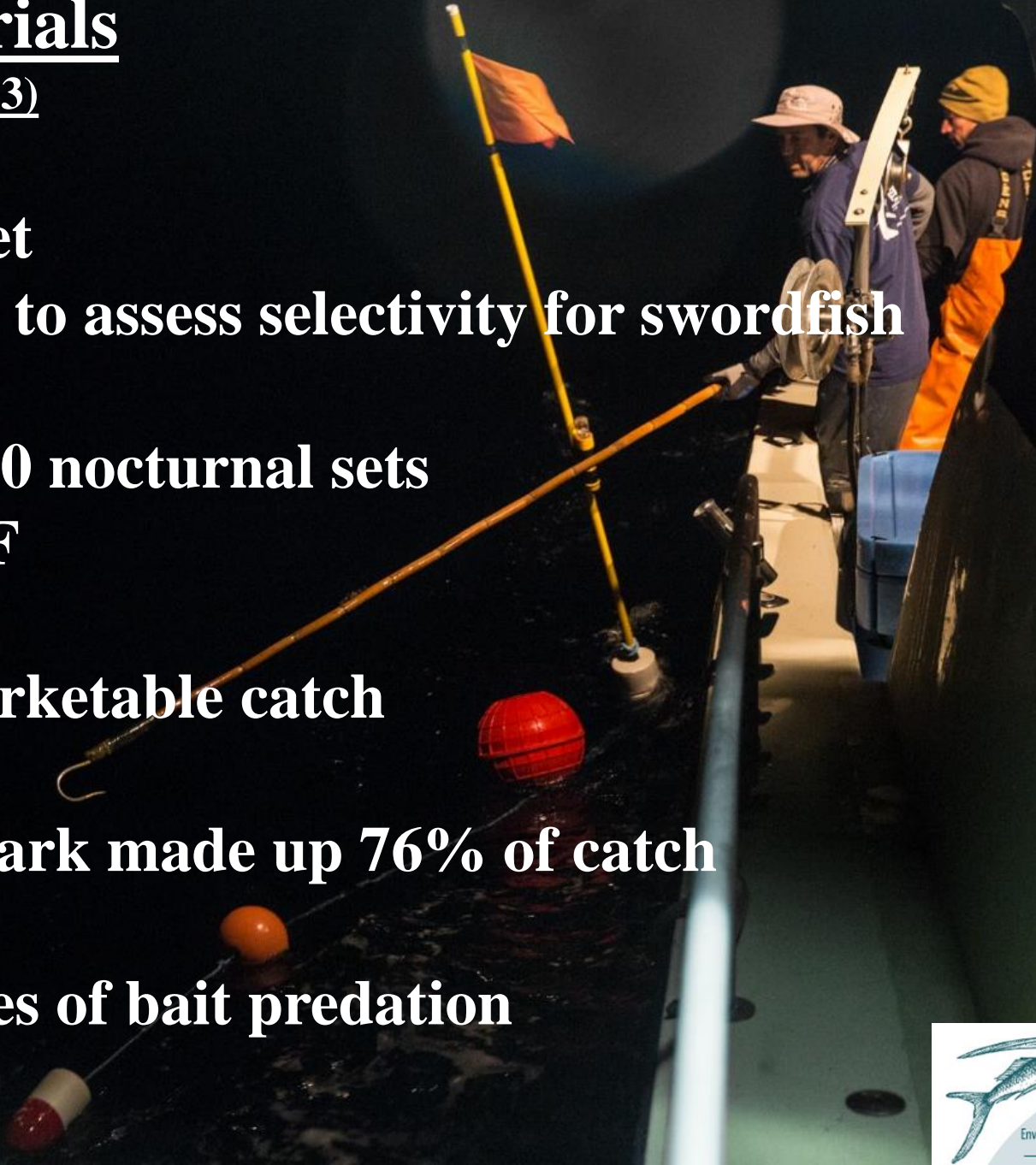
**Test shallow-set  
configurations to assess selectivity for swordfish**

**Results from 30 nocturnal sets  
~10% SF**

**20% marketable catch**

**~blue shark made up 76% of catch**

**high rates of bait predation**



# Gear Development and Linked Buoy Gear Exempted Trials<sub>(NA17NMF4270216, TNC)</sub>

## Need for linked option

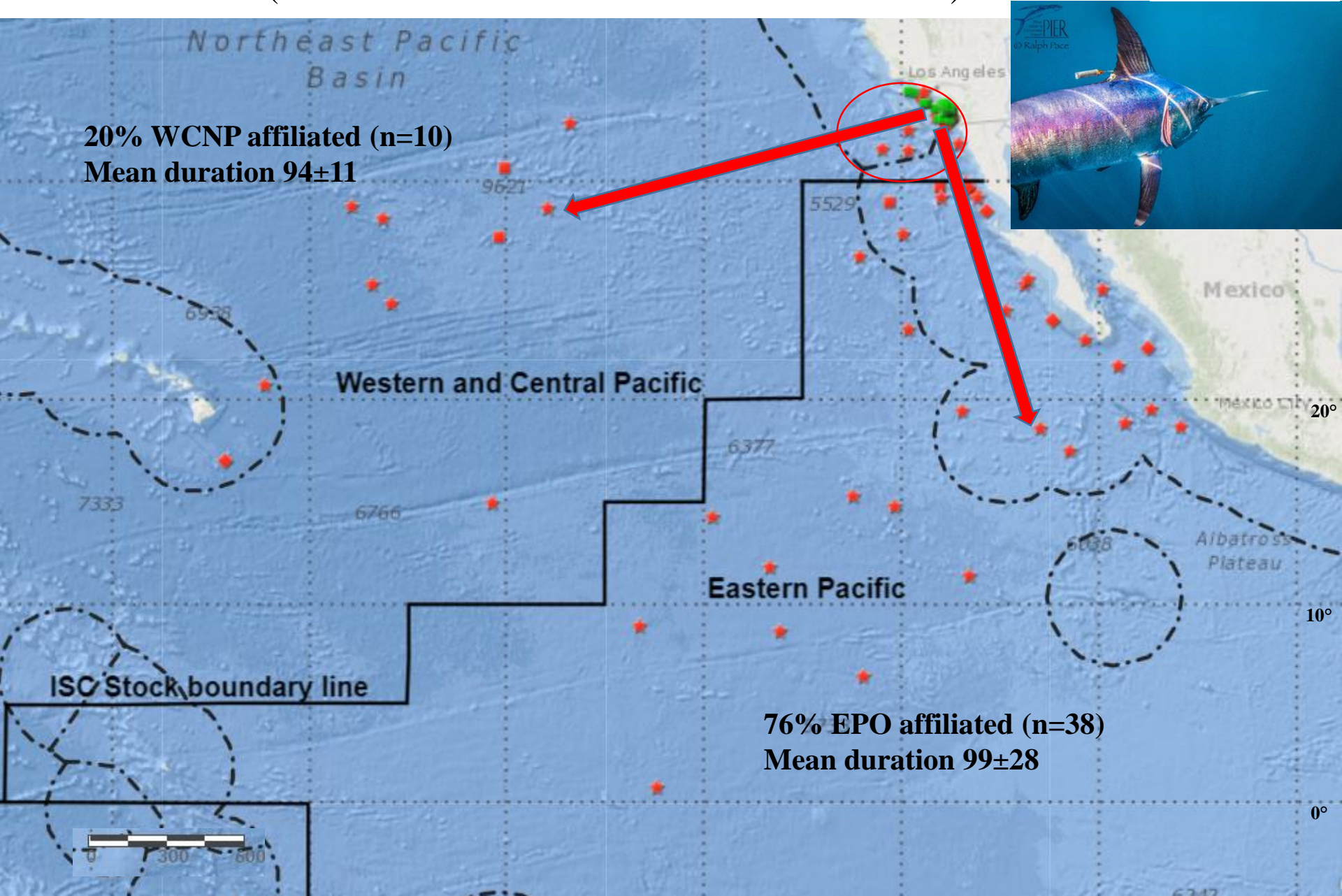
- Increase CPUE
- PLCA
- Offshore Conditions
- Larger vessels



Working with cooperative fishers to develop LBG, collect set data and tag swordfish.



# Assessing SCB migration patterns and Stock Structure (FNA16NMF4270257 and OPC # 111805971)





**SPOT Tagging**

Travelled 5,193 km in 6 months

Travelled 3,971 km roundtrip in 9 months

Molokai Fracture Zone

Clarion Fracture Zone

Hawaiian Islands

Gulf of California

Los Angeles

Mexico

Albatraz Plate

0 150 300mi





# Bigeye Thresher Shark Survivorship

BREP#s NA16NMF47220371; NA18NMF4720288; Pew Charitable Trust

- DSBG- 12/13 BET survived the acute effects of capture

Sepulveda et al., 2019 in press; Fisheries Research

- LBG –To date-All 6 BET have survived the effects of capture on LBG

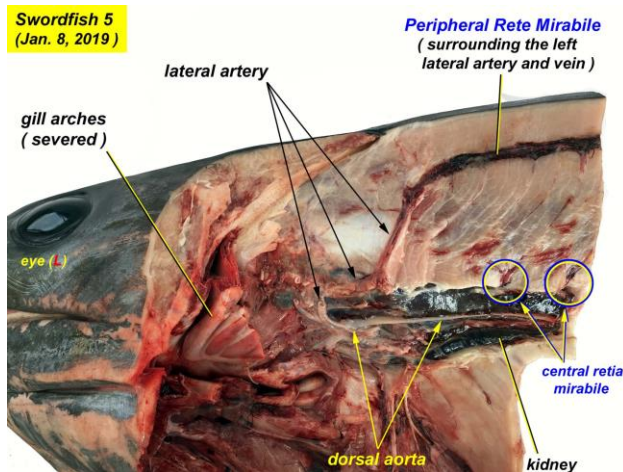
**Document fishery impacts, provide handling recommendations and advise fishers on post release disposition.**

# Other Ongoing Studies on HMS

- Swordfish, Opah and Bigeye Thresher Studies on thermal biology, cardiovascular physiology and respiratory function

National Science Foundation (IOS-1354593 and IOS-1354772; GTP)  
(Stoehr et al., 2017; Sepulveda et al., submitted)

- Post Release Survivorship of Pacific Bluefin Tuna  
( FNA15NMF4270314); (Sepulveda et al., Accepted, *Fisheries Research*)
- Movements, Tagging and Biology of Opah  
(SWFSC; TNC; Offield Family Foundation)





## **Next Steps**

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

**EFPs 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  
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Southwest Fisheries Science Center  
Bycatch Reduction and Engineering Program**

<b>George T. Pflieger Foundation</b>	<b>Pew Charitable Trust</b>
<b>The Nature Conservancy</b>	<b>Santa Monica Seafood</b>
<b>Offield Family Foundation</b>	<b>Harris Foundation</b>
<b>National Science Foundation</b>	<b>Ocean Protection Council</b>
<b>California Fisheries Research Program</b>	

**NOAA WCR & CA DFW  
HMS MT and HMSAS**

**Supporting partners and cooperative fishers**