Swordfish movements, recent gear trials, and future experiments on west coast fishery development

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Today's Talk

Introduction

Swordfish fine-scale movements

day & night trends

Description of deep-set buoy gear

2015 EFP plan

Other ongoing experiments

deep-short-line

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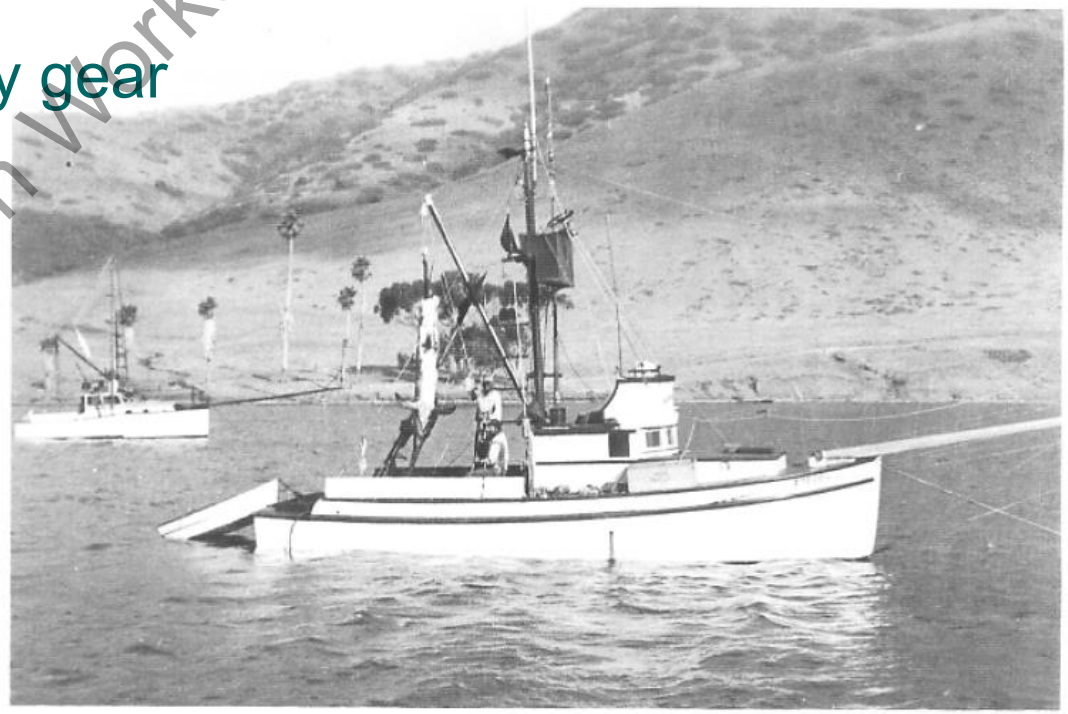

Bobby Hitt, Cat Harbor 1961

Initial studies (2004) at PIER focused on using fine-scale movement studies to augment the harpoon fishery

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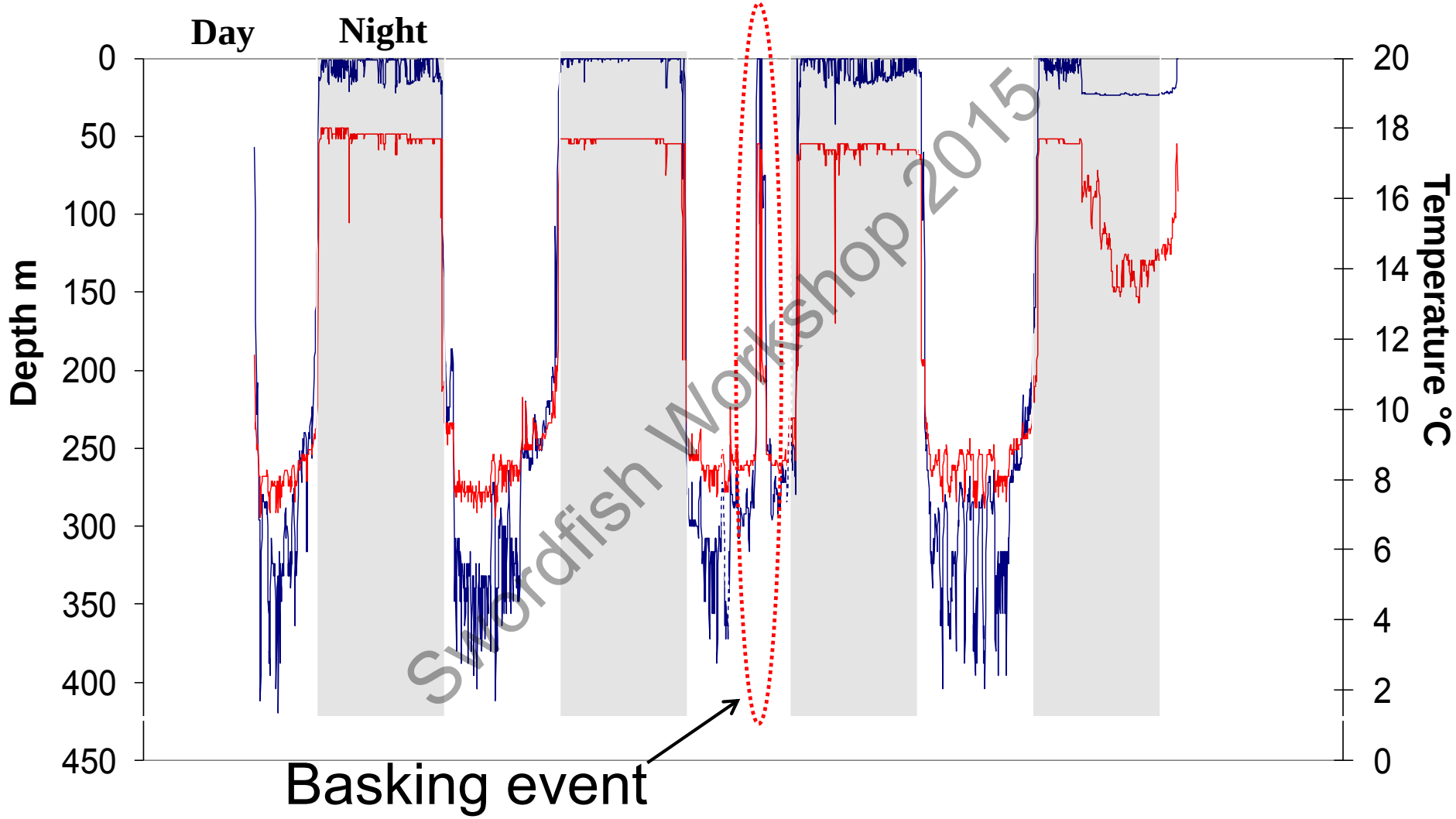
Why Harpoon?

- Low bycatch
- Long history off CA coast
- High product value
- Existing market niche
- Existing vessels and port infrastructure

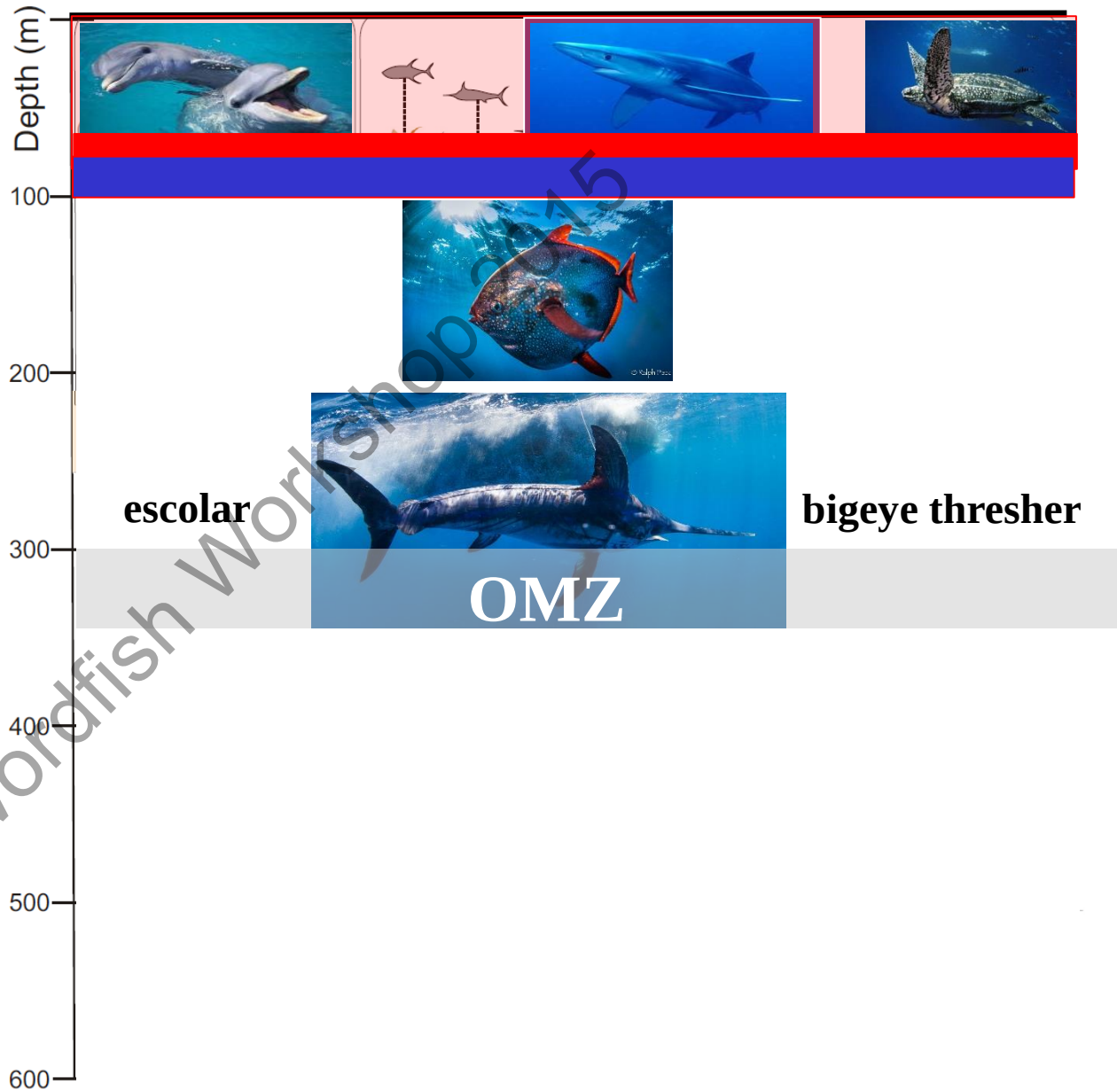
Identifying low-impact methods to augment west coast catch



5-day PSAT record from a 70kg swordfish

Daytime deep-setting is key for reducing bycatch

- **Mixed Layer**
- **Thermocline**
- **Deep-scattering layer**
- **O2 min. zone**



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SCB SF movements provide unique targeting opportunity

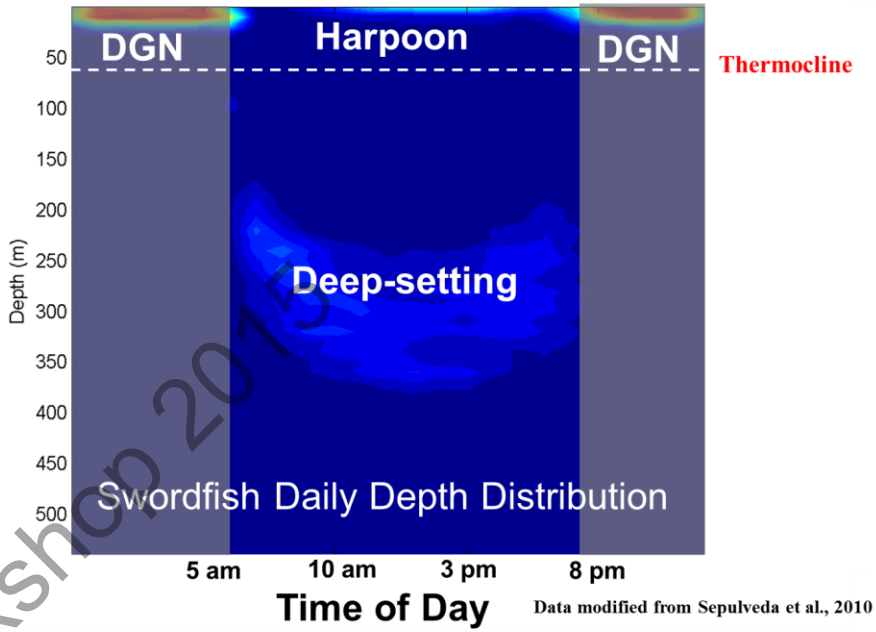
Consistent depth distribution

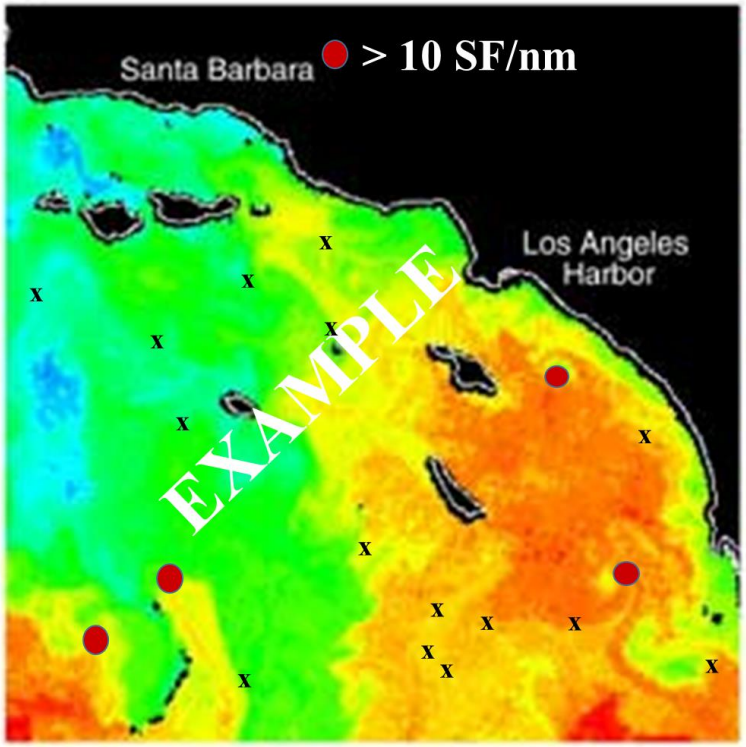
- **O2 min. layer (OMZ)**
- **DSL depth**

Patchy distribution

- **Swordfish horizontal distribution enables targeting with less gear**

  DSBG (1.5nm) & DGN (1nm)





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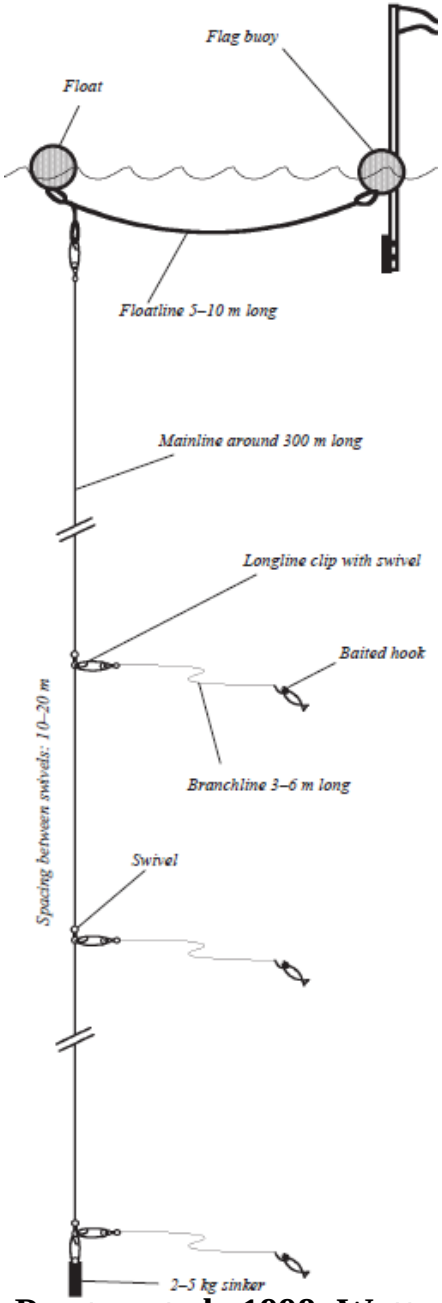
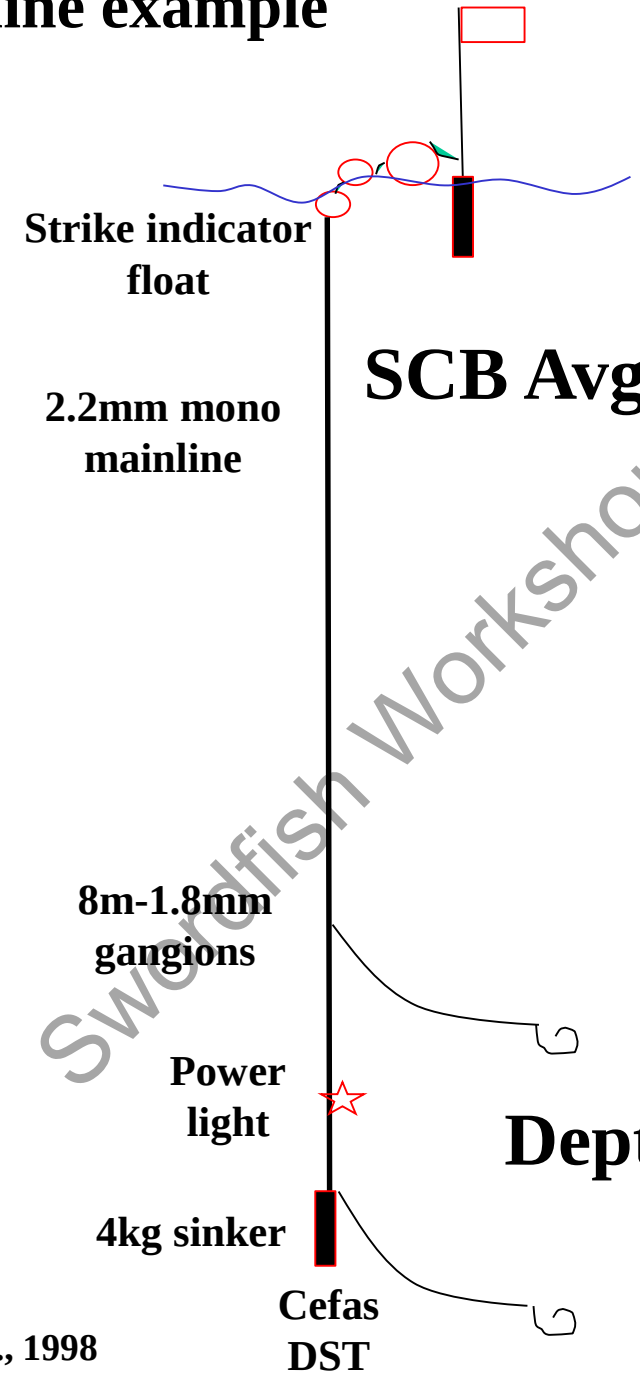
SPC vertical longline example



Preston et al., 1998; Watt et al., 1998

Trial DSBG



SCB Avg. thermocline ~71m

Depths fished 250 to 320m

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From Sepulveda et al., 2015

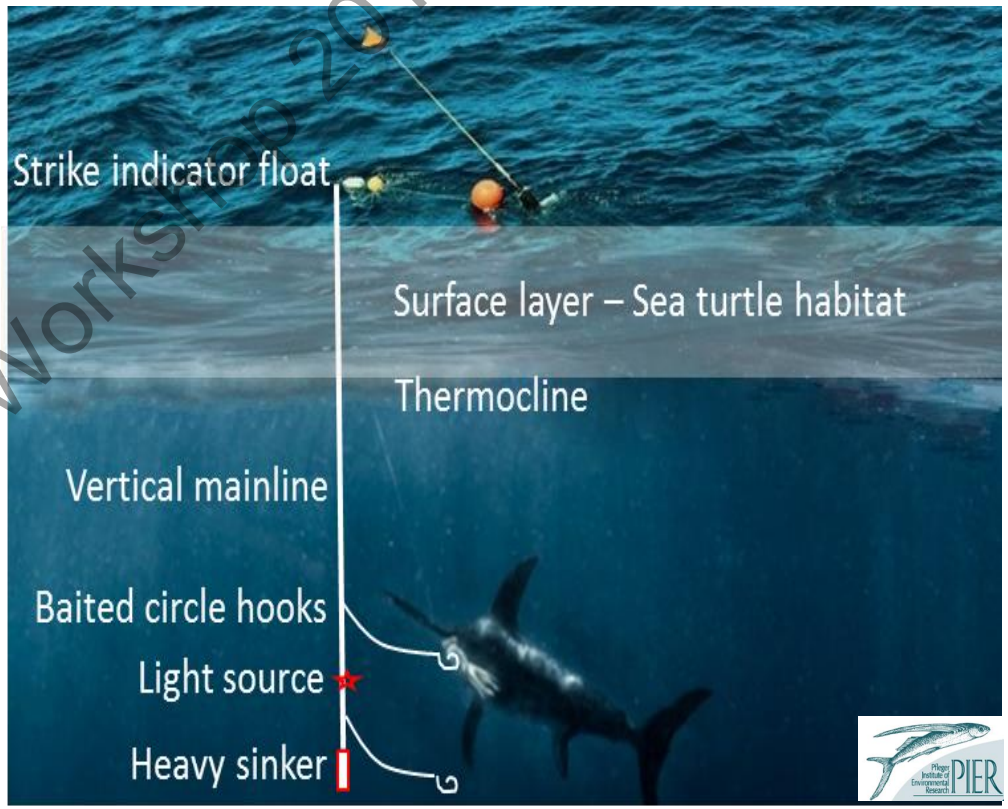
DSBG Attributes

Positives:

All hooks below the thermocline <1min

Strike indication system
rapid processing

Vertical orientation
minimizes sag and entanglement



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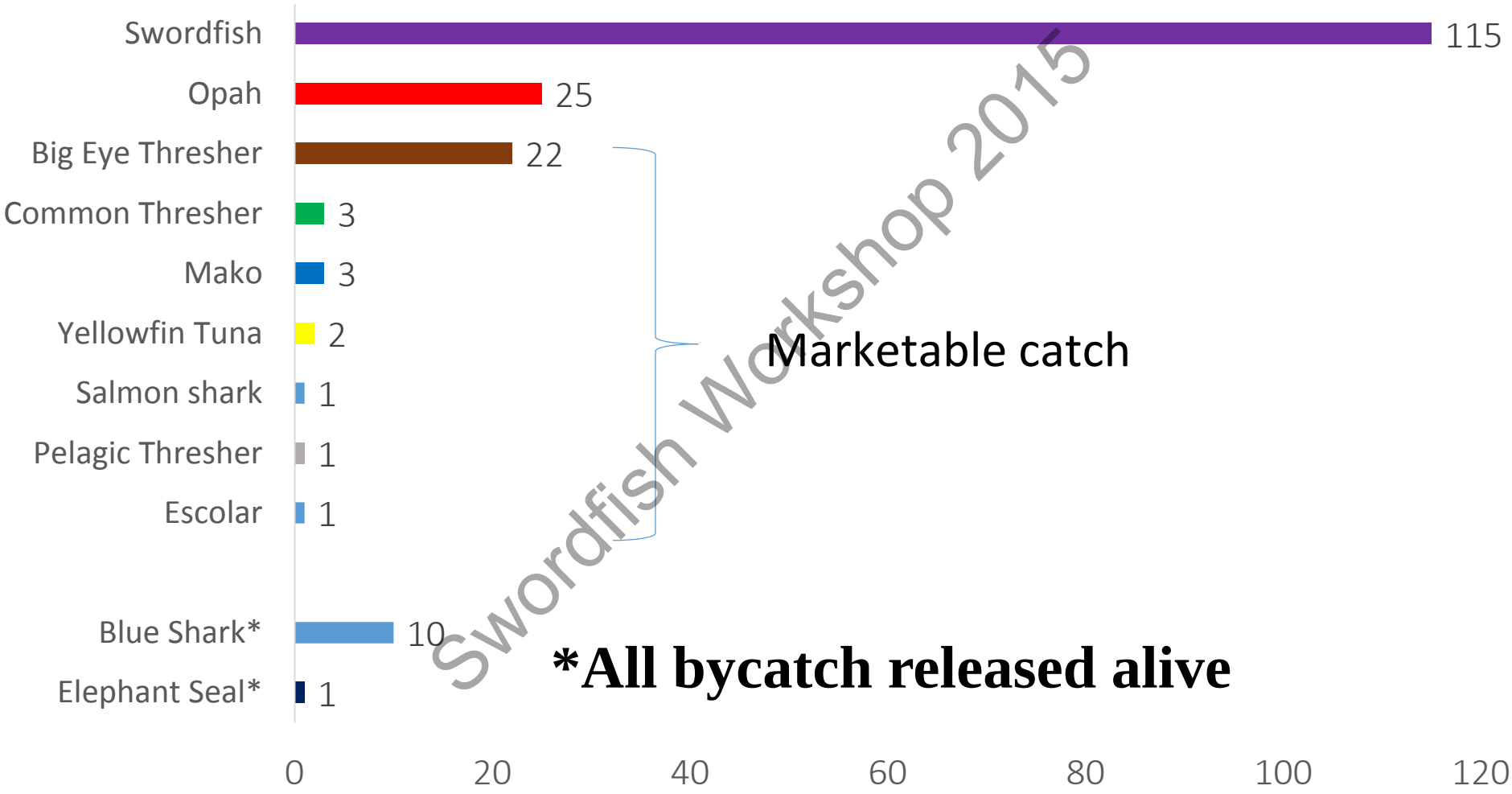
Negatives: Artisanal in nature, limited # of buoys (10) & hooks (20-30), not connected

Collective DSBG catch (2012-2014): 130 8h sets
76% target and 94% marketable catch



***All bycatch released alive**

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Next Steps for DSBG

NOAA has already funded >4yrs. of experimentation
>40,000 hook hours documenting DSBG catch

EFP Observer Coverage

Proposed 30% vs. Mandated 100%

2015 Hurdles/Issues
- cost
- coordination of effort/staffing
- gear conflicts (i.e. harpoon)
- fewer sets & cooperative fishers

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Next Steps for DSBG

EFP participation

Who?
Why?

Issues related to the "learning curve"

Why use seasoned swordfish fishermen?

2015 EFP game plan:

2-3 vessels with 100% observer coverage

Identify how many sets required to transition from EFP to implementation

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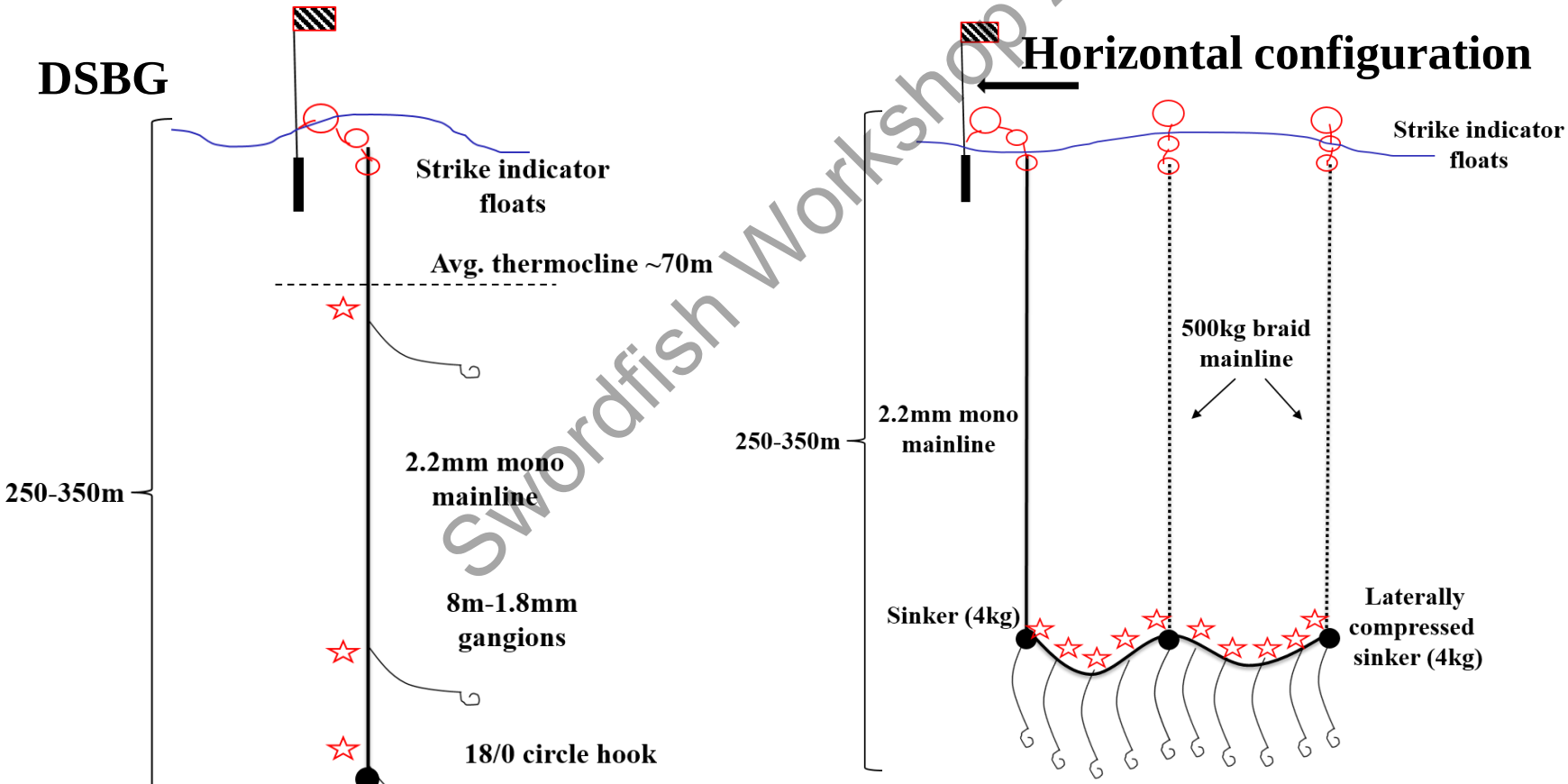
2015 Next Steps - DGN Focus

DSBG was designed to augment harpoon fishery

Focus is shifting to viable options for DGN vessels

Configurations tested under Phase II (NOAA funding, 2013 BREP)



From Sepulveda et al., 2014 BREP 1 (2014) pp. 27-32

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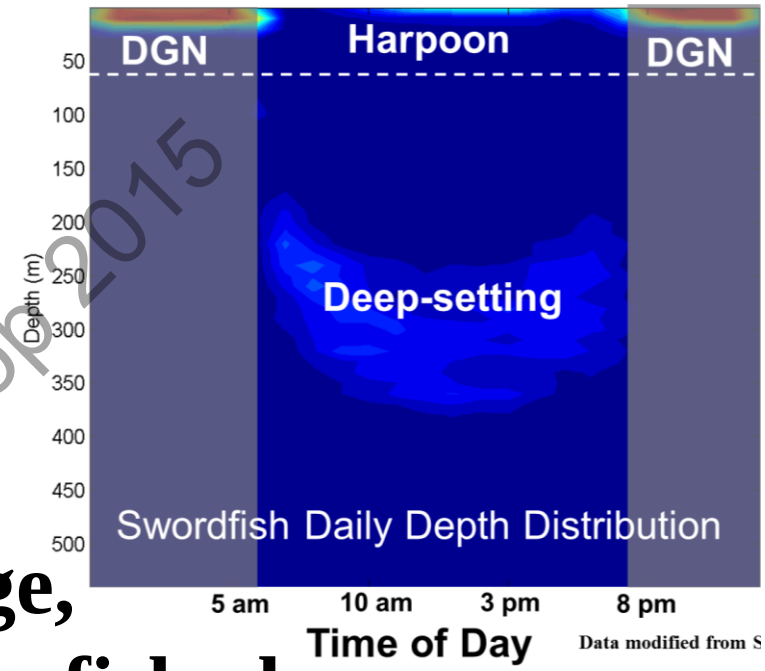
2015 Next Steps - DGN Focus



Use DSBG foundation to design a west coast gear type:

Utilize & Incorporate:

DSBG data, DGN knowledge, vessel size & times and areas fished

Strengthen west coast-based operations, reduce reliance upon foreign product and reduce bycatch in the west coast fishery

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2015 Next Steps - DGN Focus

Small deep-set line that expands DSBG:

- increase horizontal foot-print (1.5 to 5 nm)
- increase hook count (from 30 to 50)
- simplify deployment and retrieval

Incorporates DSBG positive attributes

1) Serviceability/strike detection
2) Fished during the day at depth
3) Low hook count

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Working Hypotheses:
Rapid and strategic deep-setting is the key to bycatch reduction in the west coast swordfish fishery

- West coast bycatch reduction requires depth-segregation techniques
- Rapid sink rates coupled with strategic hook placement is critical given small number of hooks & need to avoid species of concern.
- Viability is possible given swordfish distribution (vertical and horizontal) off the west coast.
- Domestic product will still need to be sold at a medium to high price-point as deep-set operations cost more than foreign and domestic shallow-set swordfish operations.

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