# Developing Mitigation Solutions to Seabird Mortality in Fisheries

NMFS National Seabird Workshop
9 September 2009, Seattle, WA

Kim Dietrich
Consultant

Ed Melvin
Washington Sea Grant Program
School of Aquatic and Fishery Sciences
University of Washington

Vessels attract seabirds

- response to discards
- lights

# How do birds interact?

- Catch
  - Passive (e.g., gillnet)
  - Active (e.g., longline)

- Collisions
  - Vessel
  - Gear (e.g., warp cables)

# Mortality – How many?

- **U.S. estimates - sparse**

| | Pelagic Longline | Demersal Longline | Gillnet | Trawl | Trap | Purse Seine | Other (troll, handline, jig, dredge) |
|---|---|---|---|---|---|---|---|
| Alaska | | A | I | A | A | X | X |
| Northwest | | I | X | X | X | X | X |
| Pacific Islands | A | X | | | X | X | X |
| Southwest | | | I | | | X | X |
| Southeast | I | I | I | X | X | | X |
| Northeast | | I | I | X | X | X | X |

A=annual; I=intermittent; X=no estimate; blank=gear not used?

# Mortality – How many?

- **U.S. estimates - sparse**
- **Global estimates – worse than sparse**

**Longline Seabird Bycatch**

- 100,000 to 300,000/year (Nel & Taylor 2003)

So what?

- Low productivity
  - Long lived, late maturity, one egg/yr or 2 yrs
- Population stability sensitive to adult mortality
- 61 species caught /25 Threatened (Brothers et al. 1999)
- 19/21 Albatrosses Threatened (IUCN 2006)

# Collaborative Conservation Approach

ID Problem/ Goal

Recruit Collaborators
Industry
Managers
University
NGOs

Advisory Body
-ID practical & effective solutions
-incentives

**Decrease bird catch with no decrease in target catch or increase in other bycatch**

Research in context of production fishing
-strict protocols

Recommendations & Future Research

Implement
Voluntary/mandatory
Outreach:
Video
Flyers
Free Gear

# Approach Rationale

- Focused on solutions not confrontation
- Proof at two levels
  - **Industry**: practical & effective solutions they identified and helped test
  - **Managers and conservation community**: scientifically rigorous results

# Mitigation research – concepts & thoughts

- 4 categories
  - Limit access
  - Reduce attractiveness of vessel
  - Increase/decrease visibility of gear
  - Deter / distract
- Techniques – all gear vs gear-specific
- Longline – best developed mitigation

Demersal longline

Salmon gillnet

# Practical Solutions for Seabird Conservation

Pelagic longline

Pelagic trawl

Case Study:

# Alaska Demersal Longline Fishery

- ~2,000 vessels - skiffs to ships
- ~ $275 million
- Pacific cod, sablefish, Pacific halibut and Greenland turbot
- Catch 4K-27K birds
- ESA species involved

# Alaska Regulations

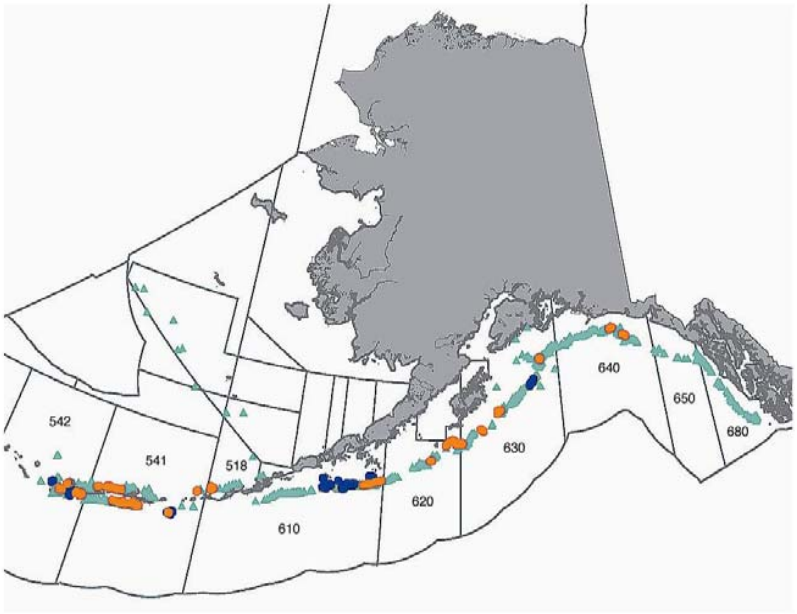
## From Industry (1997 GF & 1998 H)

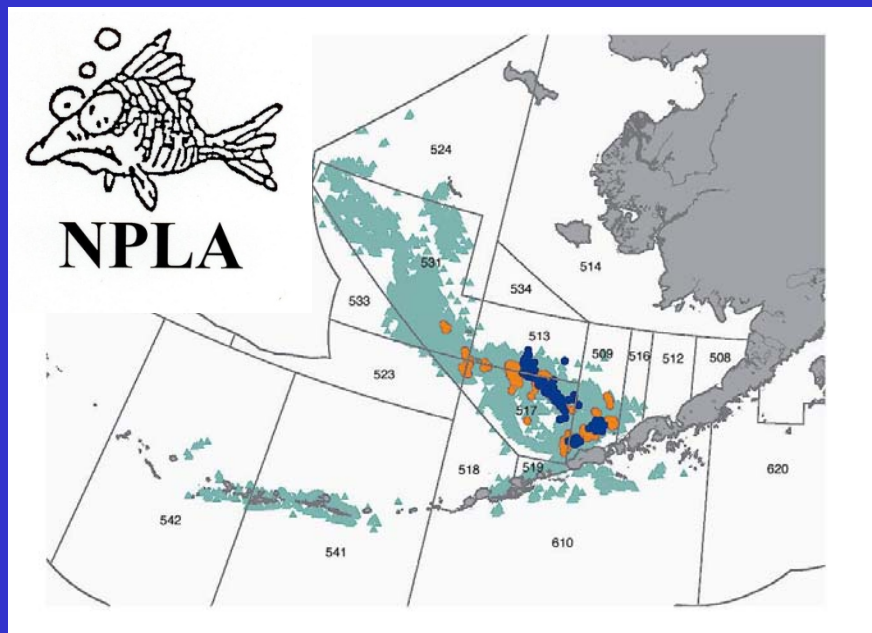
- **General**
  - Hooks sink ASAP
  - Offal discharge guidelines
  - Release hooked birds
- **Specific (Pick One)**
  - Night
  - Streamer lines
  - Towed Object (buoy, board, stick or other device)
  - Lining Tube

Sablefish - Hand Bait

2 Years
2 Fleets (target fisheries)
8 Vessels
7.5 M Hooks

Pacific Cod - Autoline



# Deterrents Tested

- Paired Streamers (PS)
- Single streamers (SS)
- Additional weight (WT)
- PS + WT

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- Underwater setting tube (Tube)
- Line shooter

# Autoline - Pacific Cod

Weights (4.5 kg/90m):
**79% Reduction**

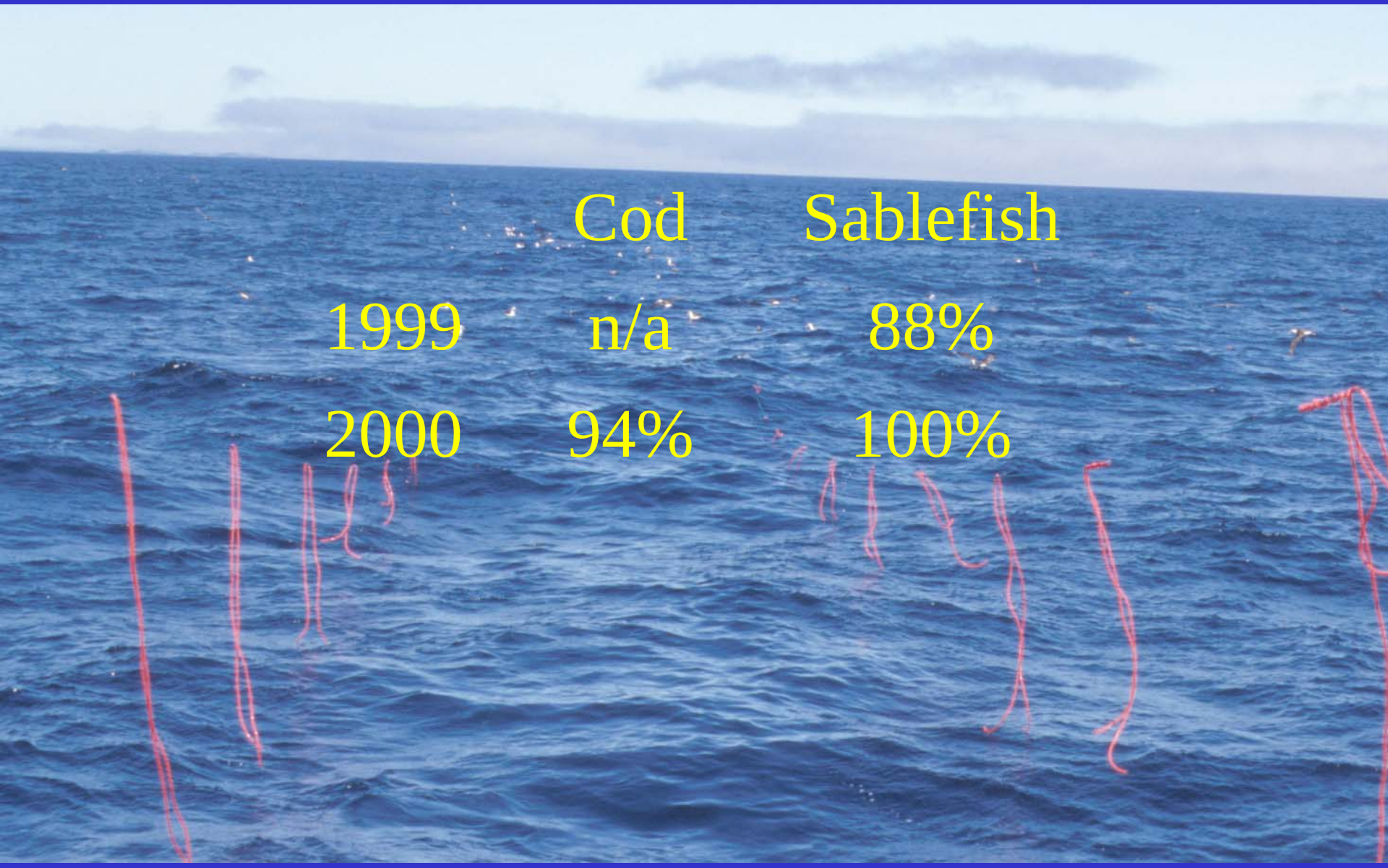
Lining Tube: **79% Reduction**

Line Shooter: 54% Increase

# Hand Bait - Sablefish

Weights (28g/100m + 2 kg/100 m): **37% Reduction**

# Paired streamers



| | Cod | Sablefish |
|---|---|---|
| 1999 | n/a | 88% |
| 2000 | 94% | 100% |

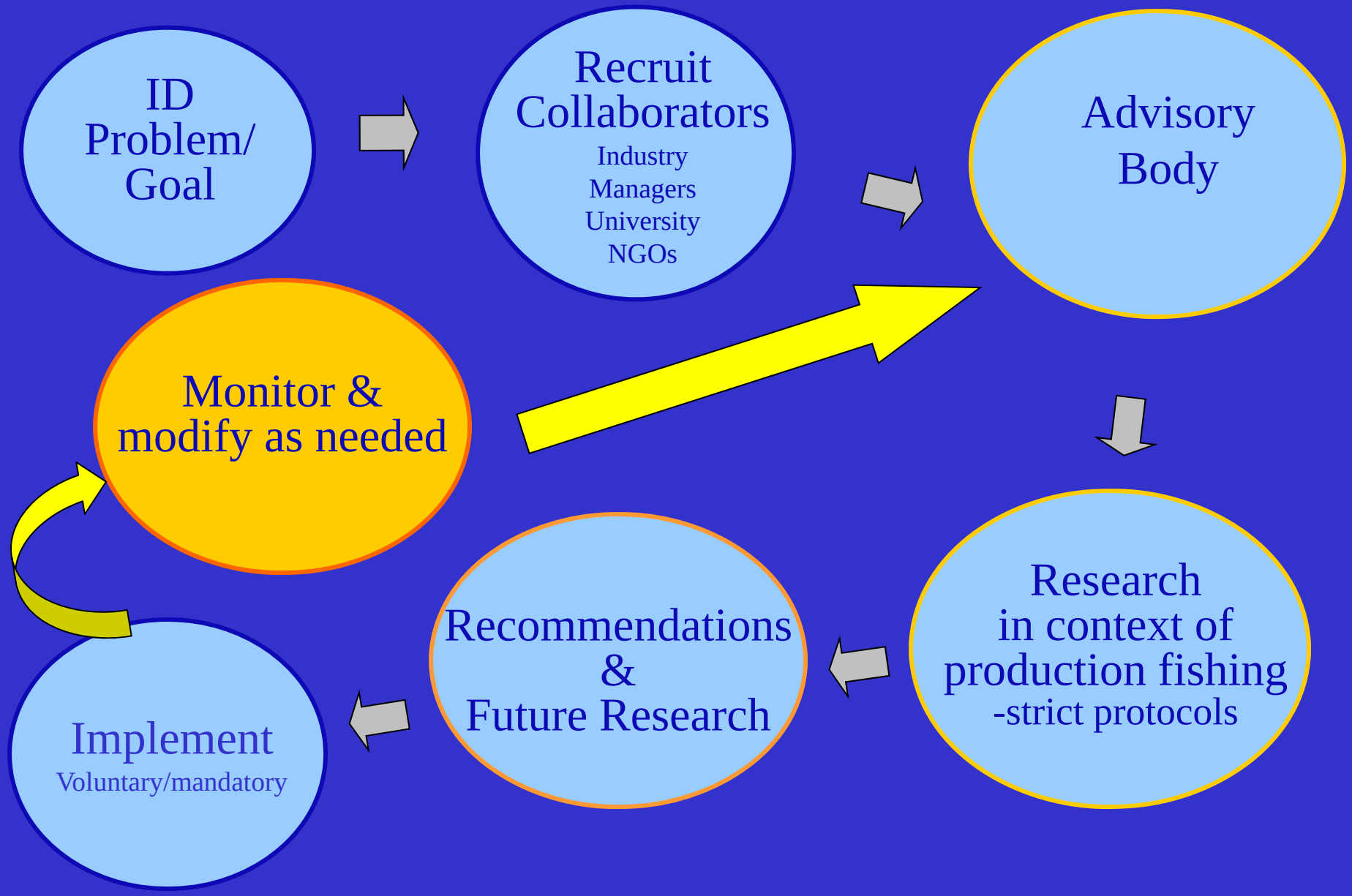
# Conclusions

- **Paired streamer lines**
  - Most comprehensive solution (all years, regions, fleets)
  - Ineffective on shearwaters
- Single streamer lines
  - 71% to 96% effective
- **No effect on target catch or other bycatch**
- **Weighting alone minimally effective**
  - Safety & extra work issues
  - Setting speed influences distance astern gear available to birds – negate benefits of weight

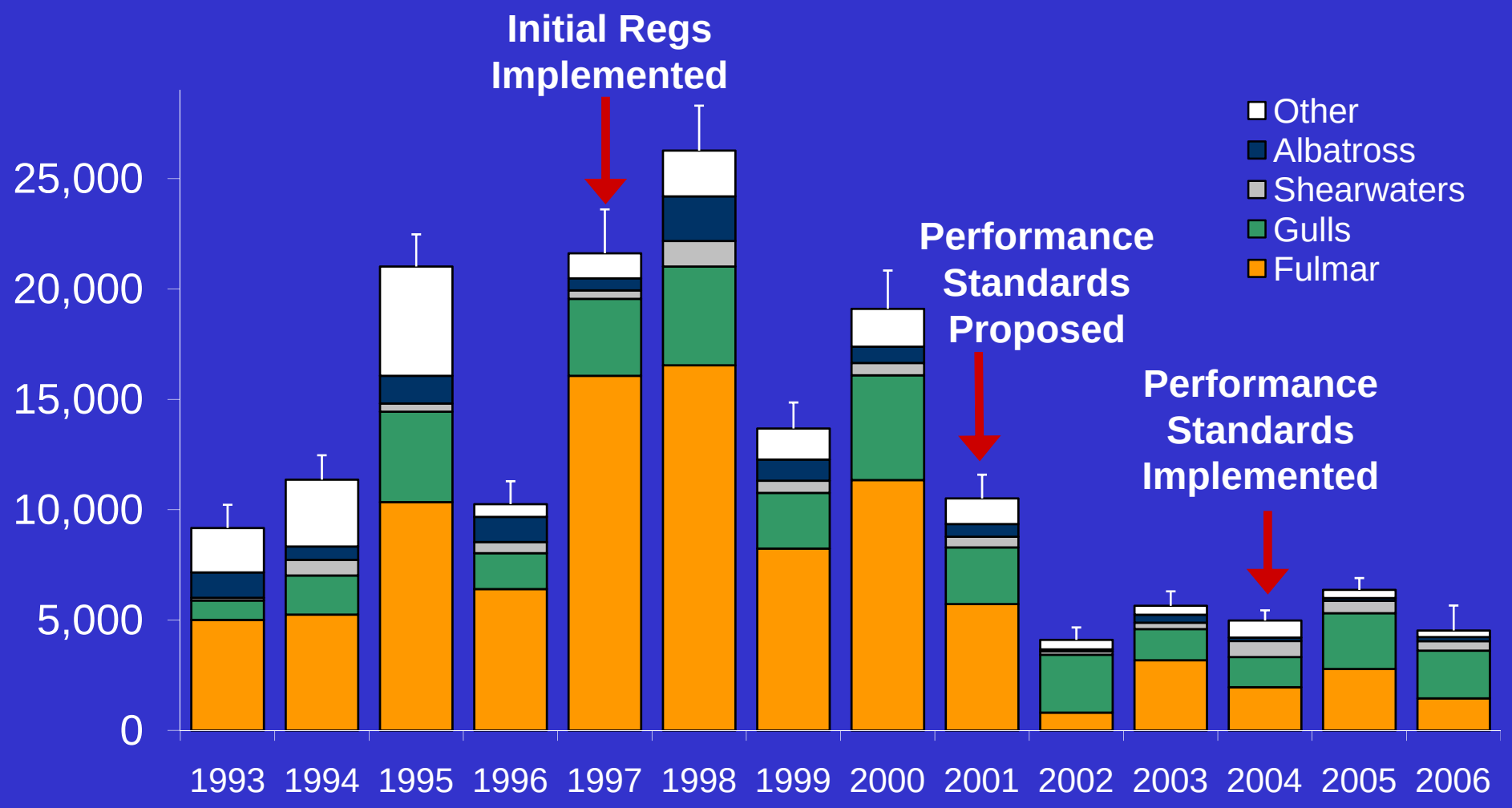
# Recommendations

- **Paired streamer lines**
  - Performance standards - Aerial extent 40/60m
  - Design specifications
  - Vary by vessel size, area fished and gear type
- **Industry peer system**
- **Expand regs to other Pacific coast regions**
- **Pursue integrated weight groundline concept**

# Collaborative Conservation Approach



# Alaska Groundfish Longline Seabird Mortality




Since 2002, catch declined ~73%

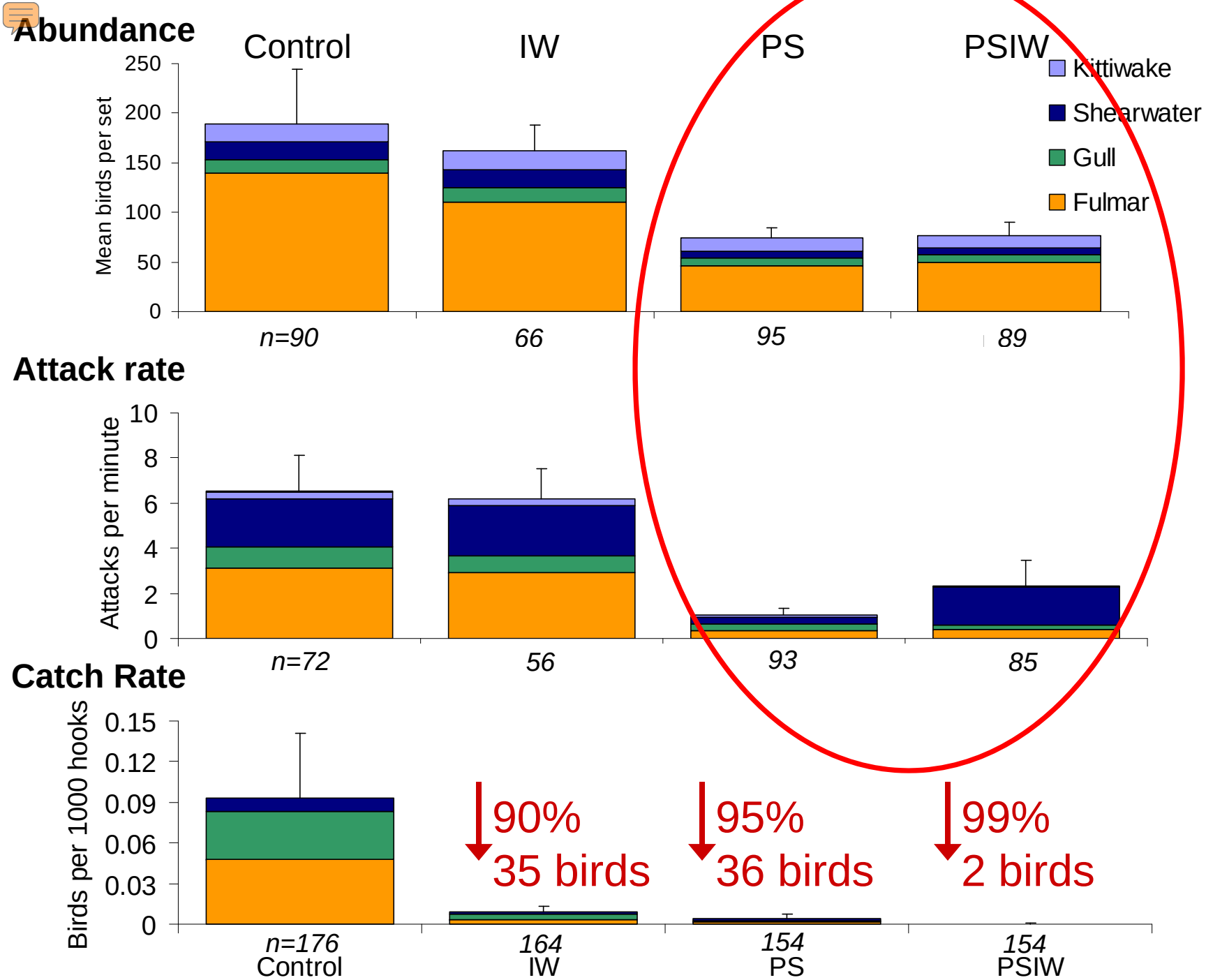
*NMFS 2008*

# Progress?

- **Paired streamer lines** √
  - Performance standards - Aerial extent 40/60m
- **Industry peer system** -
- **Expand regs to other Pacific coast regions** √
- **Pursue integrated weight groundline concept** √

# Integrated Weight Research

- July to December 2005
- Treatments: Control, IW, PS, PS + IW


Abundance
Control
IW
PS
PSIW
Kittiwake
Shearwater
Gull
Fulmar
Mean birds per set
250
200
150
100
50
0
n=90
66
95
89
Attack rate
Attacks per minute
10
8
6
4
2
0
n=72
56
93
85
Catch Rate
Birds per 1000 hooks
0.15
0.12
0.09
0.06
0.03
0
90%
35 birds
95%
36 birds
99%
2 birds
n=176
Control
164
IW
154
PS
154
PSIW

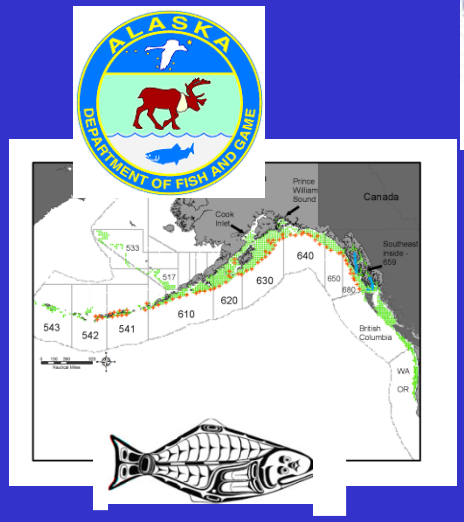
# Puget Sound Gillnet

- Julia K. Parrish, Loveday Conquest - School of Aquatic & Fishery Sciences, UW

- Puget Sound Gillnetter's Assoc.
- Nestucca Oil Spill Restoration Program
- WA Dept. of Fish & Wildlife

# Alaska Demersal Longline

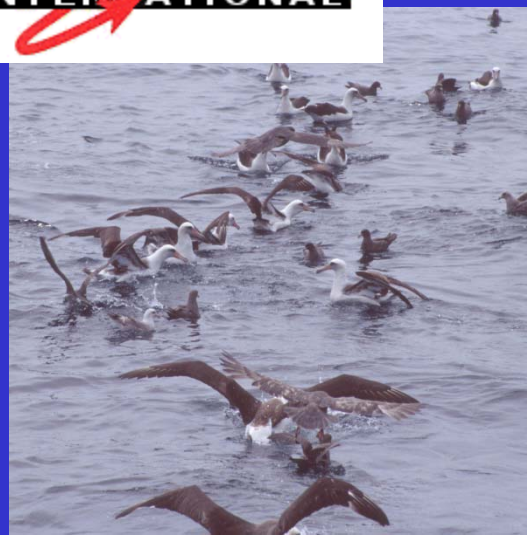
**Julia K. Parrish,**
**Owen S. Hamel,**
**Loveday Conquest –**
School of Aquatic &
Fishery Sciences, UW




INTERNATIONAL PACIFIC HALIBUT COMMISSION

# Alaska Demersal Longline Integrated Weight

**Graham Robertson**
Australian Antarctic Division

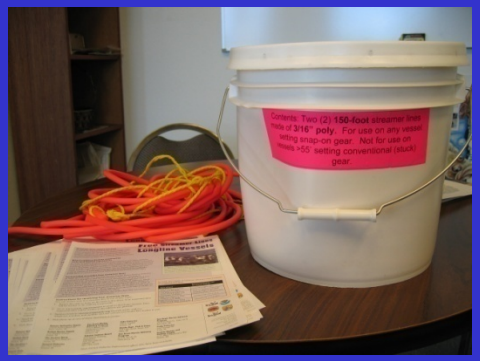


# Small Boat Mitigation

IW Line

Buoy Line Protector

Light Streamer Line

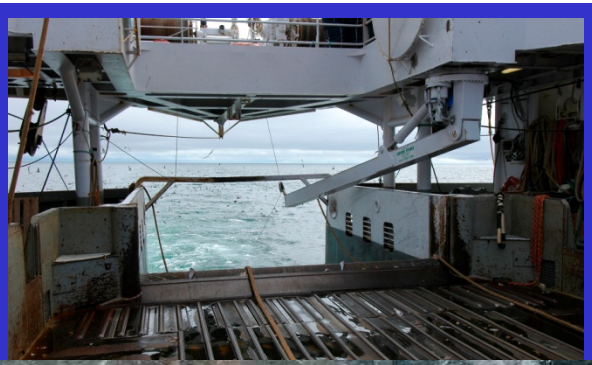


Telescoping boom

# Alaska Pelagic Trawl

Marine Conservation Alliance
promoting sustainable fisheries to feed the world

POLLOCK CONSERVATION COOPERATIVE
4039 21st Avenue W. Suite 400 Seattle WA 98199



AMERICAN SEAFOODS GROUP

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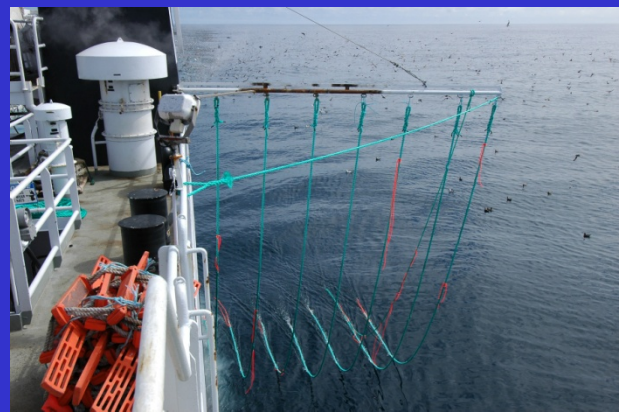
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BirdLife INTERNATIONAL



Questions?