

# SSL/Fisheries Interactions Studies

Contrasts and Comparisons

- Loughlin and Merrick 1988
- Trites and Larkin 1992
- Ferrero and Fritz 1994
- Sampson 1995
- Dillingham et al. 2006
- Hennen 2006

# Approach

- Correlation
  - L and M '88
  - F and F '94
  - Sampson '95
  - Dillingham et al. '06
  - Hennen '06
- Modeling/Simulation
  - Trites and Larkin '92

# Trites and Larkin 1992

- Examine the question of direct *mortality* caused by fishing fleet
- Could the fleet have killed enough SSL to explain the decline?



# The Rest...

- Look for relationships between fishing and SSL population trends.
- Are there patterns in the SSL decline that can be matched in time or space with characteristics of the fishing effort in the region?



# Comparisons – Spatial Coverage of Fishing Data

- L and M '88 - 60 nm boxes around rookeries
- F and F '94 - 20, 60 and 120 nm boxes
- Sampson '95 – 20 nm circles
- Dillingham et al. '06 – 74 km circles
- Hennen '06 – various distances out to 100 km rings



# Temporal Coverage of SSL Data

- L and M '88 1976 - 1988
- F and F '94 1976 - 1991
- Sampson '95 1979 - 1990
- Dillingham et al. '06 1985 - 2002
- Hennen '06 1956 - 2001





# Spatial Coverage of SSL Data

- L and M '88 8 Rookeries
- F and F '94 13 Rookeries
- Sampson '95 25 Rookeries
- Dillingham et al. '06 53 Rookeries  
and Haulouts From E and W stock
- Hennen '06 33 Rookeries

# Approach

- L and M & F and F
  - Year to Year comparisons
    - Time lags

# Results

- L and M
- F and F



No consistent patterns



# Approach

- Sampson
- PC of fishing data correlated with PC of SSL trend estimates

# Results

- Sampson → No consistent patterns

# Why Not?

- Some problems with implementation of principal components analysis
- Strange circles
- Not enough coverage of SSL data to accurately represent the decline



# Approach

- Hennen and Dillingham
  - Correlate cumulative fishing with SSL population trends

# Results

- Hennen
- Dillingham et al.

1990's - slight positive association between fishing and SSL

# Results

- Hennen →

Before 1990's – Negative association between fishing and SSL population trend