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Understanding Non-Compliance Behavior w.r.t. Pinger Regulations in the Northeast Gillnet Fishery

SSB Compliance Project

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Date
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Gillnet Pingers

Background

- NMFS primarily uses gear modification and area closures to protect marine mammals and sea turtles.
- Our objective is to identify the factors that may influence a vessel's compliance decision.
- What can we learn from the gillnet fishery?
- Can we then apply our lessons to improve compliance in other fisheries to protect marine mammals and turtles?

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Compliance Study – 3 Phases

- Phase1 - Compliance Model (2007-2010) under 1998 TRT Plan
- Phase 2 – Focus Group Ground-truthing & survey development
- Phase 3 – Compliance Model under the current harbor porpoise management plan (2010-2012)

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Phase 1
U.S. Protected Species Regulations: Understanding Non-compliance in the Northeast Gillnet Fishery

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Economics Compliance Work

- According to Becker (1968) violations are more likely when:
  - fines are lower
  - rate/likelihood of detection is lower

- BUT, Kuperan and Sutinen (1995, Sutinen and Kuperan 1999) in fisheries studies found:
  - a majority of fishermen seemed to comply even when the expected gain from violating exceeded the penalty.

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Adding in Anthropology, Sociology

- An individual might be motivated to comply because of normative influences.

- That is, there may be moral, ethical, legitimacy, or social influences present that induce an individual to comply even when the economic incentives for non-compliance are high (Weber et al. 2004, Ostrom et al. 2012 and others).

- Economic and normative factors are used in our empirical model to potentially explain an individual's compliance decision within a probit framework.

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Data

- Current Fishing Year: April 2009 – May 2010.
  We use April 2007 – May 2009 to calculate a vessel's history

2009-2010	North of 40^0	1998 Pinger Mgt. Areas (PMAs)	Observed in PMAs
Revenues	$45.6 M	$8.3 M (18%)	
Vessels	248	107 (43%)	59 (55%)

- Violation occurs when a vessel does not have the correct number of pingers attached to the gillnet. (Matches Palka and Orphanides 2008)

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Model Variables

- Perceived Detection
- Gross Tons
- Ratio horsepower to vessel length
- Years of experience gillnetting
- Gross revenues previous year
- Gillnet Gear Exclusively
- Previous violations
- Port Behavior (port of landing)
- Sectors
- TRT member in their port (port of landing)

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RESULTS

Characteristics of Individuals Most Likely to Violate

- Low level of detection
- Violated in previous years
- Use multiple gears
- Lower horsepower per foot
- Higher gross tons
- Associated with a sector

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Phase 2
Ground-truthing compliance model results

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Goals and Logistics

- Investigate (March 2012)
  - —Economic Factors
  - —Normative Factors (Legitimacy, Ethical, Social & Moral)
- Held 4 Focus Groups (Rhode Island to Maine)
- 15 Participants (Contact list provided by Bisack)
- Meeting Structure
  - —2 hour meeting, later transcribed for analysis
  - —10 minute written introductory survey

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Survey Results
Legitimacy of the problem, agency and process

- Do not believe harbor porpoise population needs protection (11/15 participants)
- Do believe the federal government has a duty to protect marine mammals (14/15 p).
- Do not believe restricting fishing is a necessary tool to protect marine mammals (9/15 p)
- Do not know who their TRT representative is (9/15 p)
- Never in touch with their TRT rep. (13/15 p)

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Survey Results
Legitimacy of pinger solution

- Pinger regulations are fair (10/15 participants)
- Sound made by pingers repels porpoise (11/15 p)
- Using pingers to reduce harbor porpoise catch in gillnets is effective (10/15 p)

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Survey Results: Moral/Ethical

- Regulations should not be followed if they are not effective (10/15 participants)
- Regulations should be followed even if they are not fair (10/15 p)
- Attitudes of my peers about violations is:
  - It is wrong (2/15)
  - Not wrong (6/15)
  - Don’t know (7/15)

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Survey Results: Social Influences

- Belong to some group (13/15 participants)
- Belonging to a group does not influence their decision (12/15 p)
- Individuals I know comply with fishery regulations
  - Always (5/15 p)
  - 75% or more of the time (5/15 p)
  - 0-75% of the time (5/15 p)
- Individuals I know comply with MMPA regulations
  - Same as fishery regulations

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Survey Results
Economic Considerations

- Do not know whether pingers lower their profits (10/15 participants)
- Do not know the size of fines for an MMPA violation (13/15 p)
- No clear trend in answers concerning their perception of frequency of pinger violations being detected

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RESULTS
Group Interviews

1. Over sampling by observers influences compliance decisions
2. They are aware of and know the “Repeat Violators”
3. Perceive that punishments are non-existent for “Repeat Violators”
4. Sector members disagreed with model result that they are more likely to violate
5. They do not discuss pinger regulations in a group/sector setting as they do general fisheries regulations

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Group Interviews: Some Topics to Investigate

- Pinger compliance among sector members not transparent
- Do we need to examine by individual sector?
- Fishermen all know a subset of individuals that comply but don't know how common compliance is overall
- TRT – venue, membership, frequency was also raised as an issue. How does the TRT process compare to the fishery management council process?
- Do we need to use homeport instead of port of landing for port-based normative variables?

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Phase 3 Updates to the Compliance Model (2010-2011)

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Phase 3: Compliance Model Under 2007 TRT Plan

1. **Data**
   - **Current Fishing Year: April 2010 – May 2011**
     - **Use April 2008 – May 2010 to calculate a vessel's history**
   - **No. of Vessels = 97 observed in current year**

2. **Results – Individuals likely to violate**
   1. **Perceived Detection**
   2. **Multiple gear use**

3. **Issue – Not enough history for the full model – Need 2011-2012 data**

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What did we learn?

- Management within and across sectors varies
- Members of a sector are not certain about compliance of peers
- Self-policing works best in small groups of similar people
- Level of observer sampling can influence compliance behavior
- Individual compliance feedback from the observer program to operators/owners is sometimes missing
- Targeting and prosecuting individuals who violate repeatedly can foster a sense of fairness and legitimacy in relation to the regulations

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Next Steps

Additional focus groups in the spring – HP and sea turtle

Finish up the second model run with updated data

Analyze all the focus group data

Discuss possible changes to model variables

Consider a broader protected species compliance survey

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Sample Representativeness between all vessels fishing in pinger mgt areas and vessels in compliance sample

	All	Sample
No. Vessels	137	59
Avg. Revenue	$280K (158%)	$231K (54%)
Length	40.3’ (16%)	40.0 (12%)
Len/VHP	8.2 (68%)	7.7 (31%)
Gillnet Gear Exclusively	60% of vessels	

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Captain Consistency for sample of 59 vessels (2007-2010)

% of VTR Trips	Number of Vessels	% of Vessels
100	20	34
95	11	53
90	7	64
80	7	76
70	4	83
60	4	89
50	3	95
40	3	100%