Stated Preferences for Size and Bag Limits of Alaska Charter Boat Anglers

Daniel K. Lew
Alaska Fisheries Science Center, NOAA Fisheries
University of California, Davis

2014 Recreational Fisheries Constituents' Economic Workshop
January 29-30, 2014
Silver Spring, Maryland

*The information and results presented here are preliminary. Opinions expressed are those of the authors and do not reflect those of NMFS, NOAA, or the U.S. Department of Commerce.
Background

- Primary federal species is Pacific halibut (*Hippoglossus stenolepis*)
- Pacific salmon is frequently caught on saltwater sport fishing trips
- No MRIP/MRFSS survey in Alaska
- AFSC periodically collects primary economic data of recreational fishing behavior and preferences (RP/SP)
AFSC Alaska Saltwater Sport Fishing Economic Surveys

- Repeated mail surveys conducted in 2007 and 2012
- Collected data on fishing behavior for previous season (2006 and 2011 fishing seasons, respectively)
- Stratified random samples drawn from ADF&G fishing license frame (and PID “senior identification” database)
  - All non-residents (age 16+) and resident anglers (age 16-60) required to have license
  - Residents 60+ can qualify for a PID
- Stratification based on residency
  - 3 populations: Non-residents, resident anglers of Southeast Alaska, and other Alaska resident anglers (different survey versions)
  - Response rates have been about 50%
Survey Development

Main types of data collected

**RP data:**
Where did anglers fish?
How often?
What did they harvest?
Travel information

**SP data:**
Choice experiment questions to evaluate, in part, how counterfactual regulations affect value of fishing experience

Focus groups and interviews
Anchorage
Juneau
Fairbanks
Portland
Seattle
Phoenix
Sacramento
San Francisco Bay Area
Charter Pacific Halibut Management in Alaska (Areas 3A & 2C)

• In the charter boat sector, regulatory changes have occurred for Pacific halibut in recent years

• Catch sharing plan (CSP) (NEW in 2014)

• Regulations on anglers
  • Bag limits
  • Size limits

• Charter boat angler-specific regulations in Area 2C (Southeast)
  • 2007 – 2008: 2 fish, 1 any size, 1 no longer than 32 inches
  • 2009 – 2010: 1 fish, no size limit
  • 2011: 1 fish, no fish longer than 37 inches
  • 2012 – 2013: 1 fish, no fish between 45 and 68 inches (reverse slot)

• Under CSP, these regulations will be evaluated annually for both Area 2C and 3A
Sample SPCE Question

**D4** Choice A, Choice B, and Choice C are described in the columns below. Below the columns, indicate which of these three choices you like best and which you like second best.

<table>
<thead>
<tr>
<th>Fishing area</th>
<th>Choice A</th>
<th>Choice B</th>
<th>Choice C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of fishing days</td>
<td>Southeast</td>
<td>Southcentral</td>
<td>Do something else in Alaska other than saltwater charter boat fishing</td>
</tr>
<tr>
<td>Fish targeted</td>
<td>1 day</td>
<td>1 day</td>
<td>3 per day</td>
</tr>
<tr>
<td></td>
<td>Halibut</td>
<td>Halibut</td>
<td>(3 total)</td>
</tr>
<tr>
<td><strong>Bag (take) limit</strong></td>
<td>No fish between 35 and 130 lbs.</td>
<td>No fish larger than 35 lbs.</td>
<td></td>
</tr>
<tr>
<td><strong>Size restriction</strong></td>
<td>Restrict: the size of fish in the per day bag limit (length limits converted to pounds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish targeted</td>
<td>Silver salmon</td>
<td>Silver salmon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 per day (6 total)</td>
<td>3 per day (3 total)</td>
<td></td>
</tr>
<tr>
<td><strong>Cost per person</strong></td>
<td>$700</td>
<td>$1,000</td>
<td></td>
</tr>
<tr>
<td>(Fishing-related COSTS only)</td>
<td>Can include charter/rental fees, transportation, food, and other costs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Which do you like best? (Check one box)
- [ ] Choice A
- [ ] Choice B
- [ ] Choice C

Which do you like second best? (Check one box)
- [ ] Choice A
- [ ] Choice B
- [ ] Choice C
2012 Survey Implementation: Non-Residents

• Conducted from February-June 2012

• Modified Dillman mail-telephone survey
  — Advance letter
  — Initial mailing w/ $1 incentive
  — Reminder postcard
  — Follow-up telephone call
  — Second full mailing

• Initial mailing sample of 2,080 (1,998 deliverable)
  — 1,073 completed surveys (response rate = 53.7%)

• Stated preference estimation
  — 825 surveys used for estimation
    • Excludes item non-respondents to SPCE questions
    • Drop protest respondents and those not at all confident in responses
  — Discrete choice modeling allowing for preference heterogeneity (different anglers allowed to have different preferences for fishing attributes)
### Willingness to Pay for SE Trips Under Alternative Halibut Restrictions

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Fishing Trip Description</th>
<th>WTP Estimate</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One halibut no size limit</td>
<td>$1,028</td>
<td>($391, $1,712)</td>
</tr>
<tr>
<td>2</td>
<td>One halibut no larger than 23 lb*</td>
<td>-$201</td>
<td>(-$743, $301)</td>
</tr>
<tr>
<td>3</td>
<td>One halibut no larger than 28 lb</td>
<td>$149</td>
<td>(-$389, $675)</td>
</tr>
<tr>
<td>4</td>
<td>One halibut no larger than 35 lb</td>
<td>$666</td>
<td>($73, $1,263)</td>
</tr>
<tr>
<td>5</td>
<td>One halibut not between 28 and 130 lb</td>
<td>$318</td>
<td>(-$282, $875)</td>
</tr>
<tr>
<td>6</td>
<td>One halibut not between 35 and 130 lb</td>
<td>$820</td>
<td>($219, $1,490)</td>
</tr>
<tr>
<td>7</td>
<td>Two halibut limit, no size limit</td>
<td>$1,002</td>
<td>($96, $2,034)</td>
</tr>
<tr>
<td>8</td>
<td>Two halibut limit, one fish no larger than 28 lb</td>
<td>$1,683</td>
<td>($904, $2,506)</td>
</tr>
<tr>
<td>9</td>
<td>Two halibut limit, one not between 28 and 130 lb</td>
<td>$1,618</td>
<td>($936, $2,258)</td>
</tr>
<tr>
<td>10</td>
<td>Two halibut limit, both no larger than 28 lb</td>
<td>$637</td>
<td>($127, $1,135)</td>
</tr>
<tr>
<td>11</td>
<td>Two halibut limit, both not between 28 and 130 lb</td>
<td>$1,050</td>
<td>($559, $1,560)</td>
</tr>
</tbody>
</table>
Discussion

• Welfare estimates and confidence intervals provide insights into halibut bag limit and size regulations
  • Width of confidence intervals suggest no statistical difference between WTP associated with numerous regulations (for 2+ fish in bag limit)
  • The ability to harvest at least one trophy fish seems valuable
  • Conservation ethic is suggested, as size restrictions on 2+ fish are valuable

• Potential policy applications
  • Evaluating effects of changes to bag and size limits (regulatory analyses)
  • Economic impact analysis of fishing regulation changes
    • Lew and Seung (2010, NAJFM): Use SP model to predict changes in fishing participation as a shock in regional economic impact model

• Main issues
  • Periodic implementation due to no dedicated funding
  • OMB approval
  • Timing of surveys, analysis, and final results – implies the need for flexibility of tools
Some Related Papers

Recreational fishing demand modeling

Stated preference choice experiments

Modeling effects of bag limit changes on economic impacts