

Analysis of Management Options for the Area 2C Charter Fishery for 2012

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Background

- Analyze:
 - Maximum size limits (hybrid method)
 - Reverse slot limits
 - Closures on selected days of the week
- Likely GHGs of 788 and 933 K lb.
- Assume 1-fish daily bag limit.

Goal

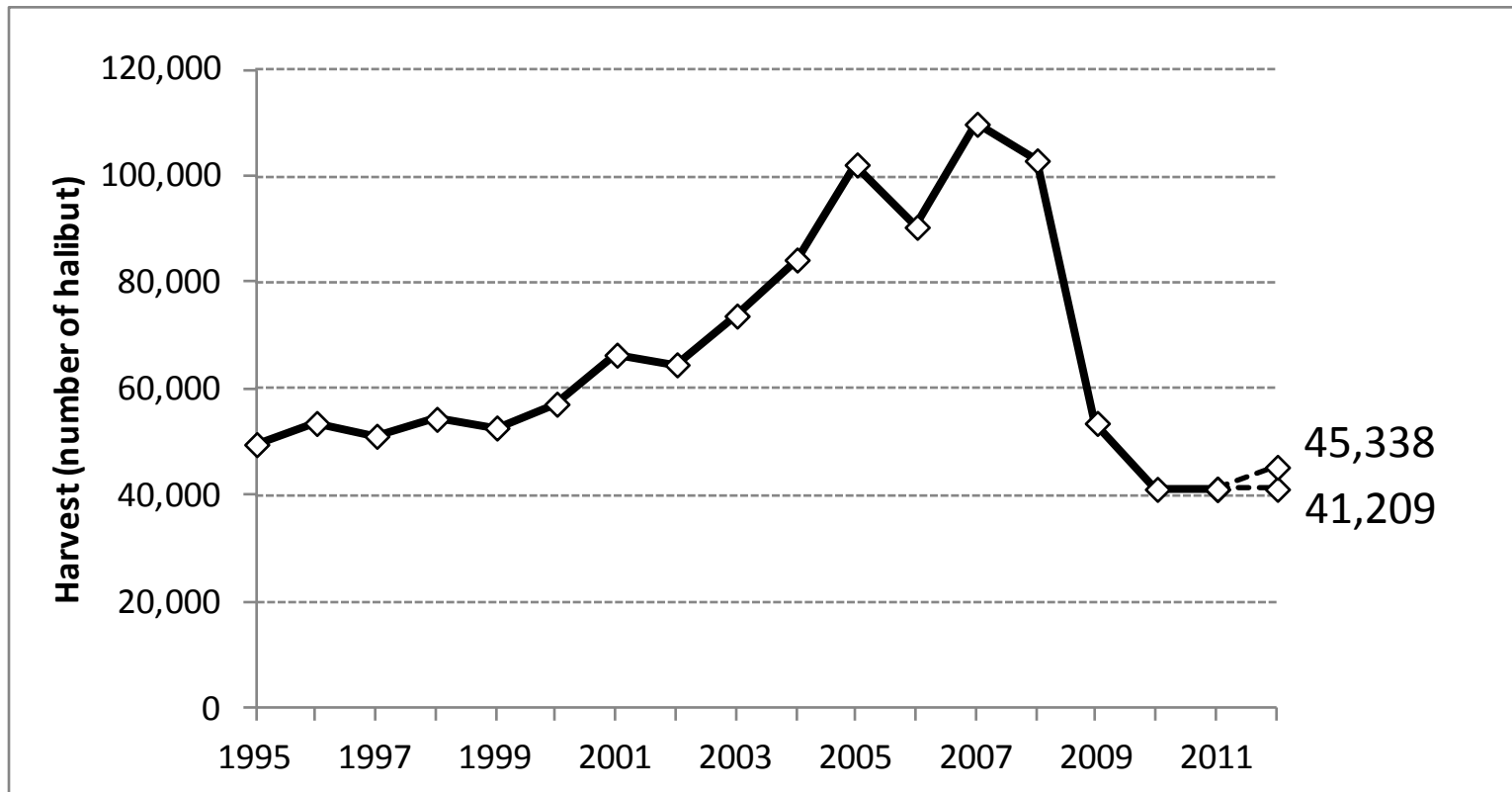
- Identify viable management measures that constrain harvest under 2 possible GHGs



Forecast 2012 unconstrained harvest

- Recent data is best indicator of future
- Two options:
 - 2011 harvest projection (similar to 2010)
 - 2009-2011 average
- Liberalization of size limit in 2012 may increase harvest; restrictions may decrease it. Not enough information to model it.

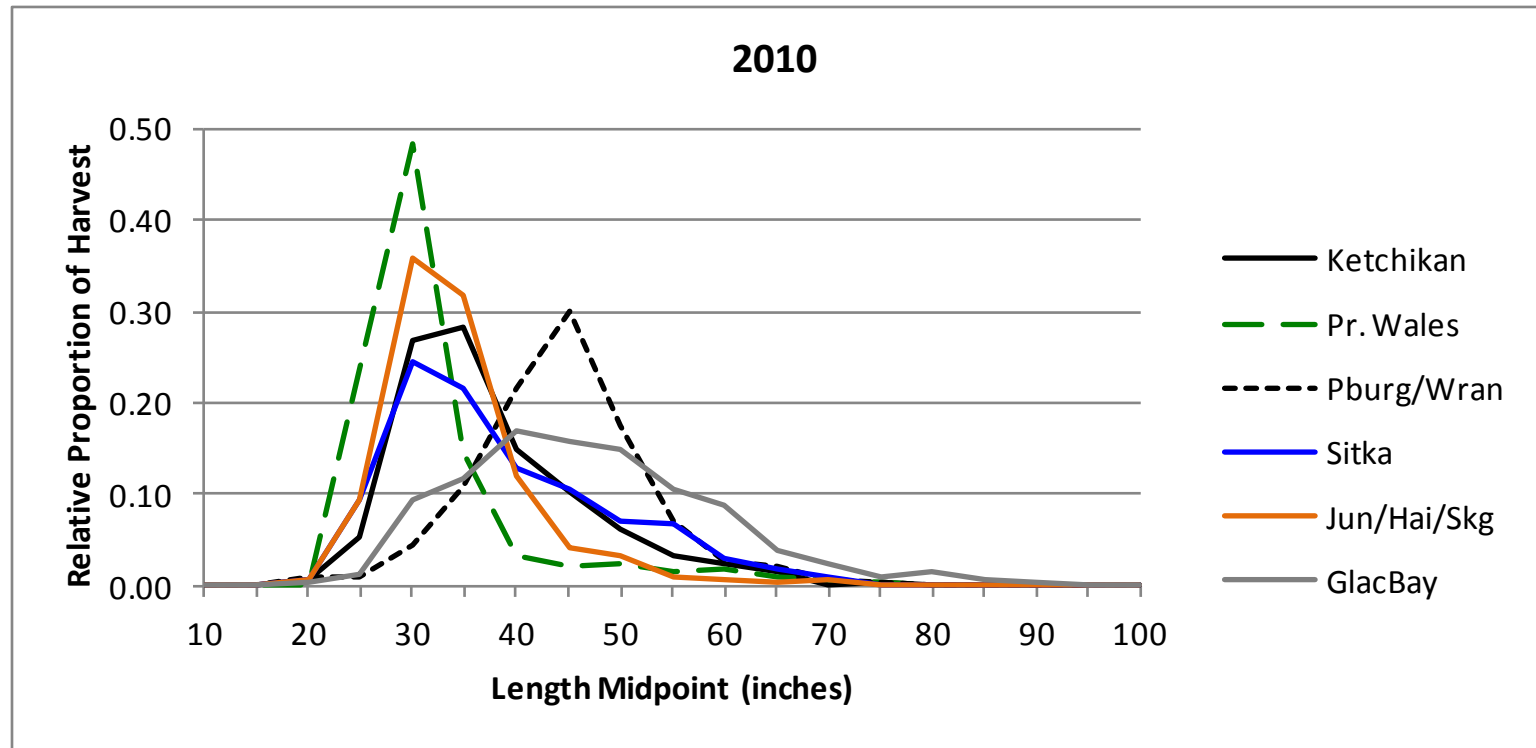
2012 harvest projection options



1. Maximum size limit

- Hybrid method
- Conservative (assumes all fish over limit are replaced with fish equal to the limit)
- Assume no effect of on the harvest (number of fish).
- Yield calculations done by subarea and then summed.

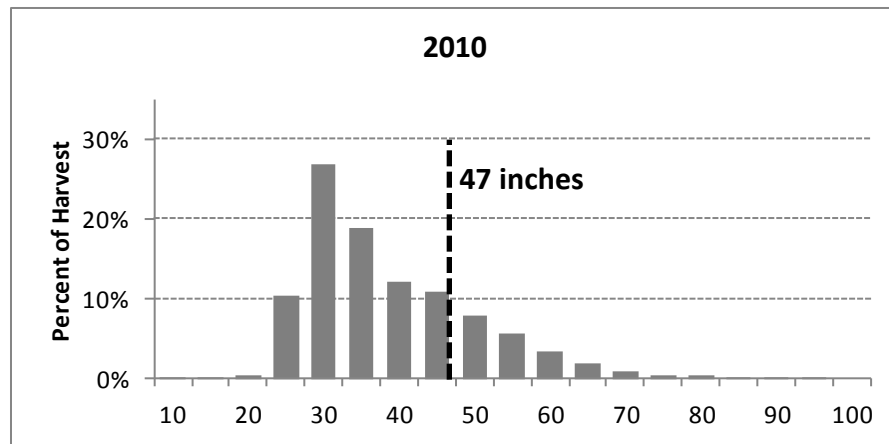
Maximum size limit



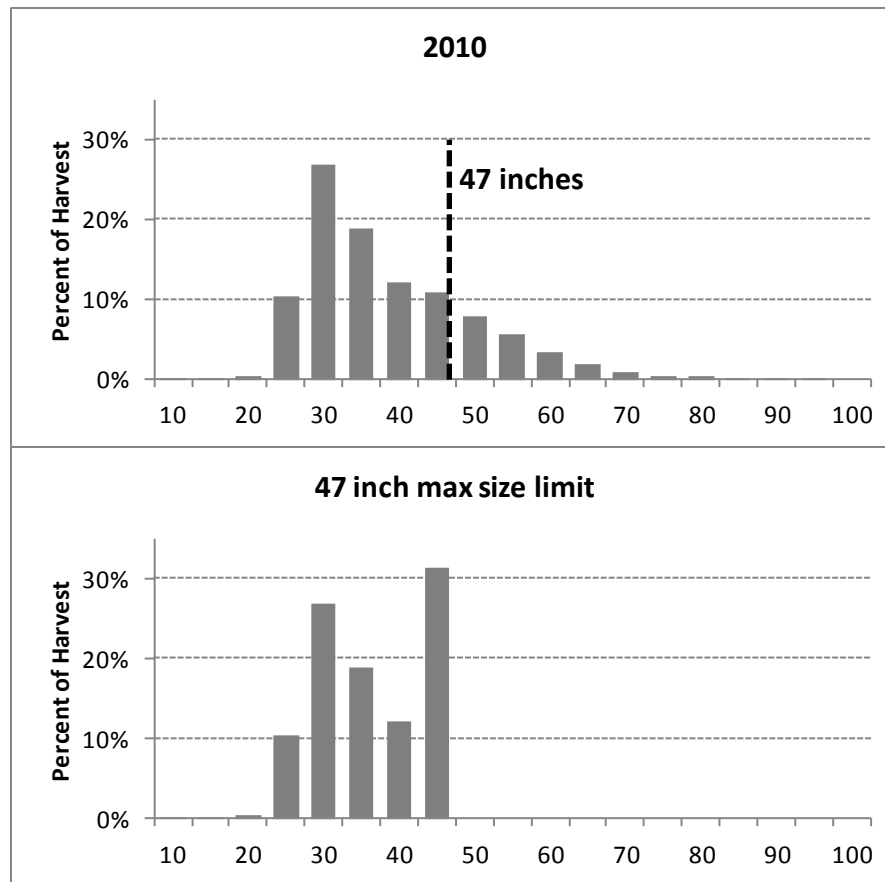
Maximum size limit

- Assumptions:
 - 2010 length comp representative of 2012 without a size limit
 - Assume fish over the size limit will be replaced with fish of the size limit

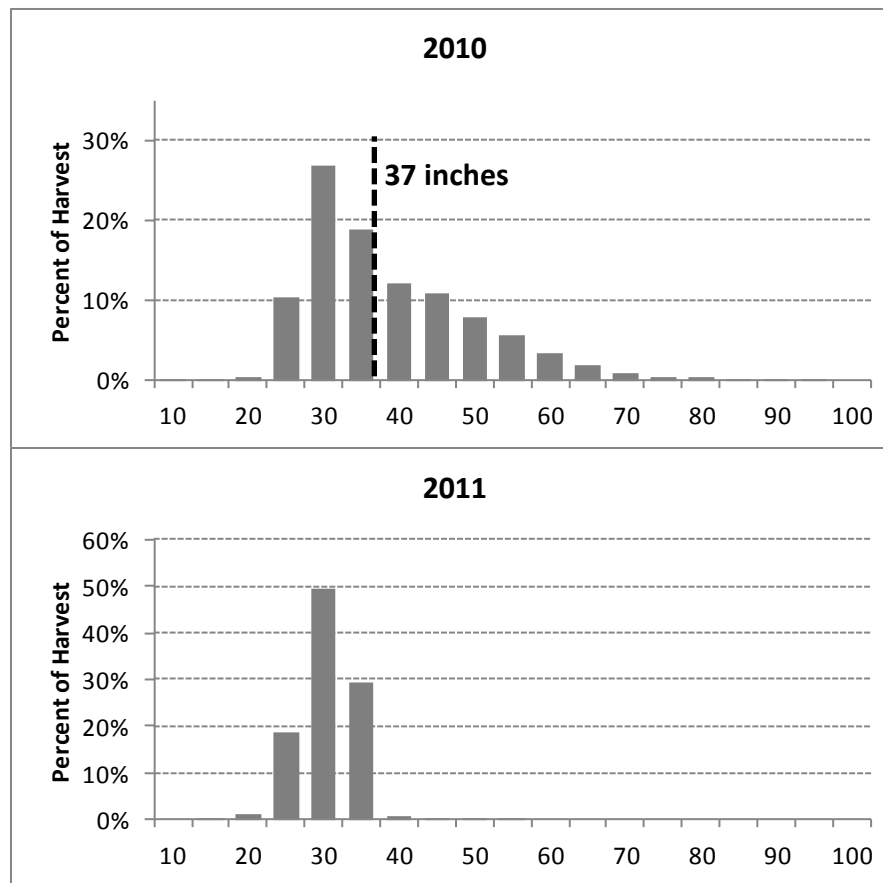
Maximum size limit



Maximum size limit



Maximum size limit



Maximum size limit

GHL	Viable Size Limits (round wt)	
	Harvest = 41,209	Harvest = 45,338
788,000 lb	47 in (49 lb)	44 in (40 lb)
931,000 lb	55 in (82 lb)	49 in (56 lb)

Maximum size limit

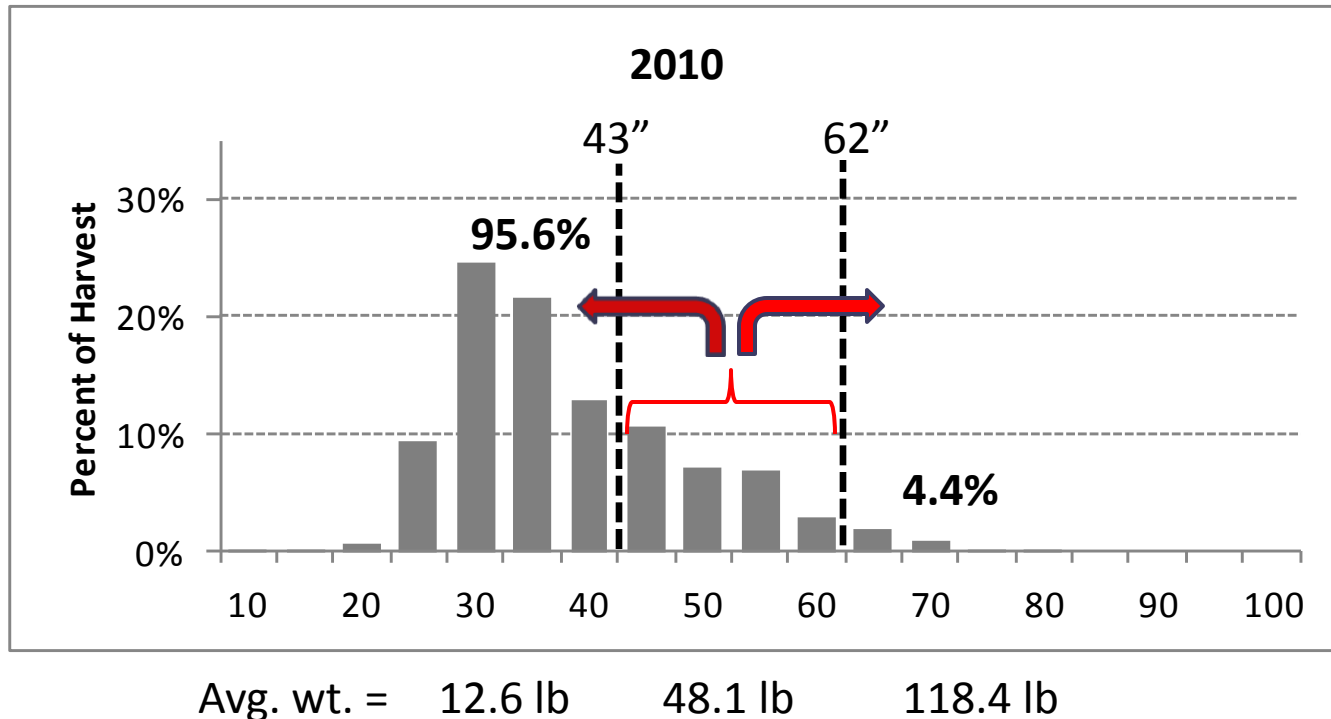
- Potential effects:
 - Proven effective in constraining average weight.
 - Will require proof of size.
 - No legal retention of exceptionally large fish.
 - Effects (if any) on yield and angler demand likely to vary by subarea.
 - May be additional handling mortality at higher maximum size limits.

2. Reverse slot limit

- Assume no effect on harvest (number of fish).
- Assume fish in the prohibited slot are replaced with fish above or below limits in proportion to harvest in 2010.
- Alternate calculations assuming additional high-grading.
- Yield calculations done by subarea and then summed.

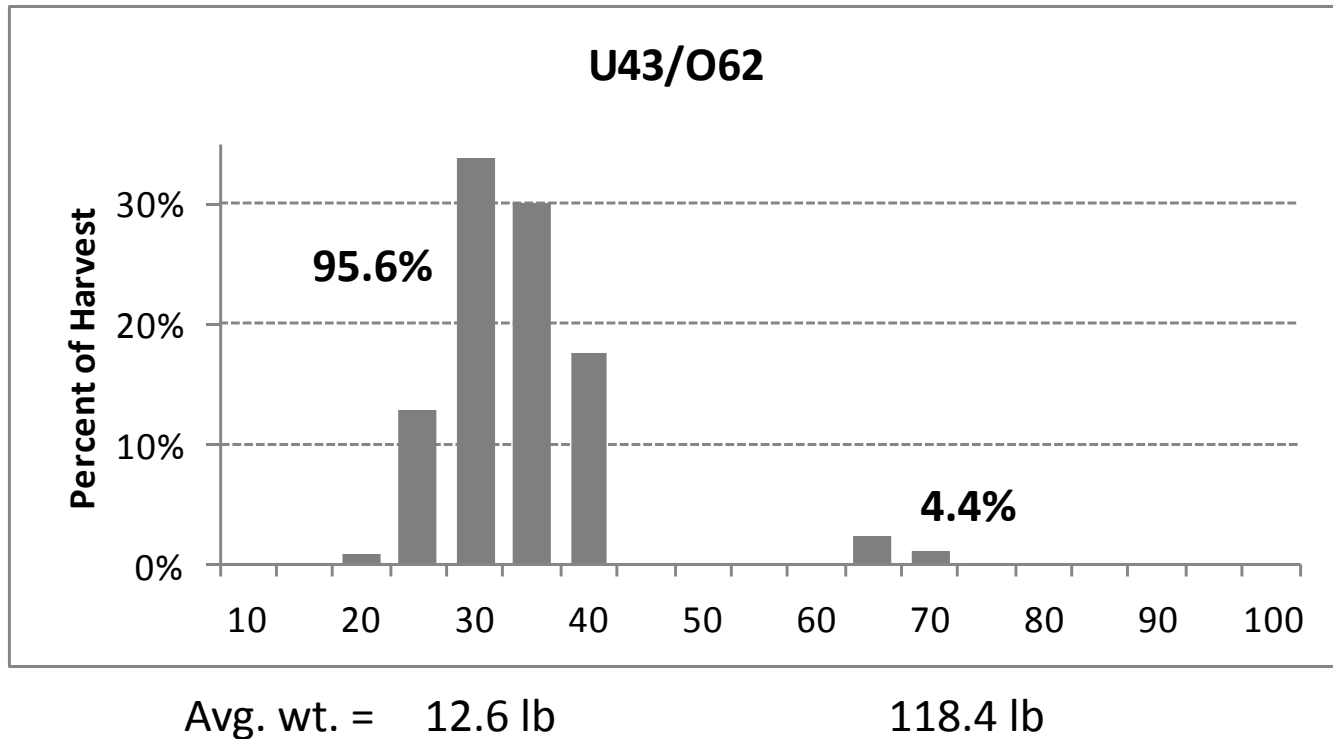
Reverse slot limit

Overall average wt = 25.3 lb

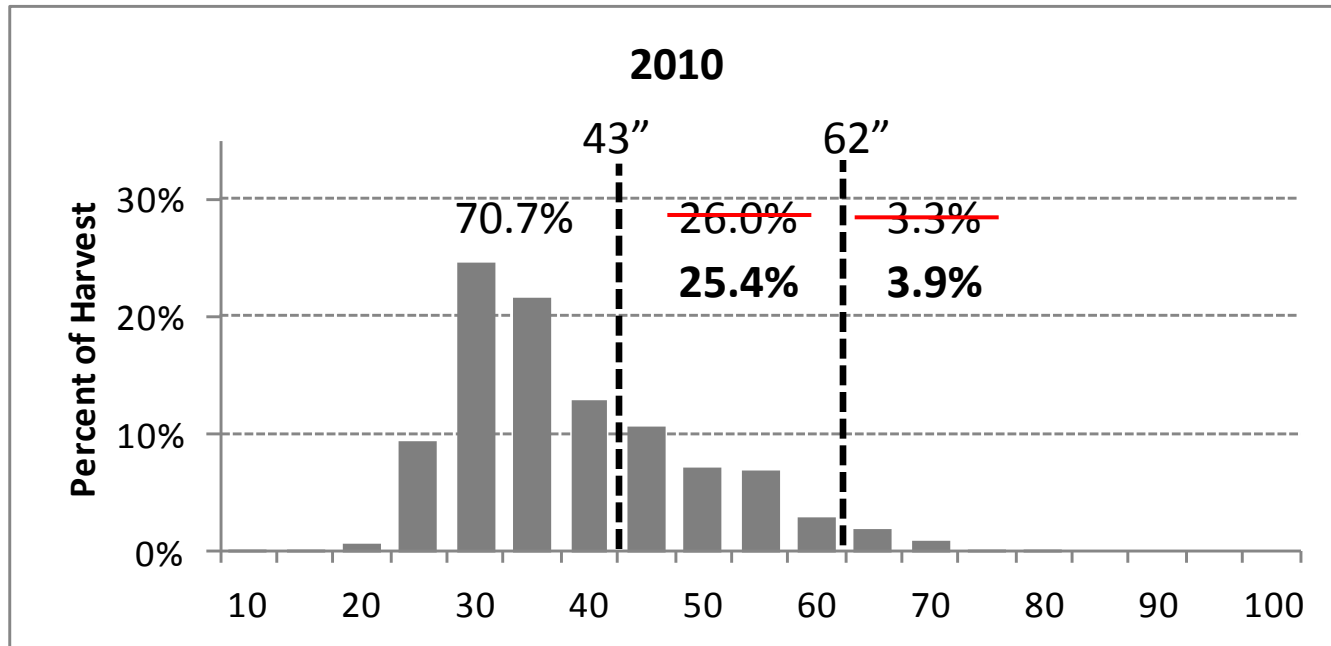


Reverse slot limit

Overall average wt = 17.3 lb



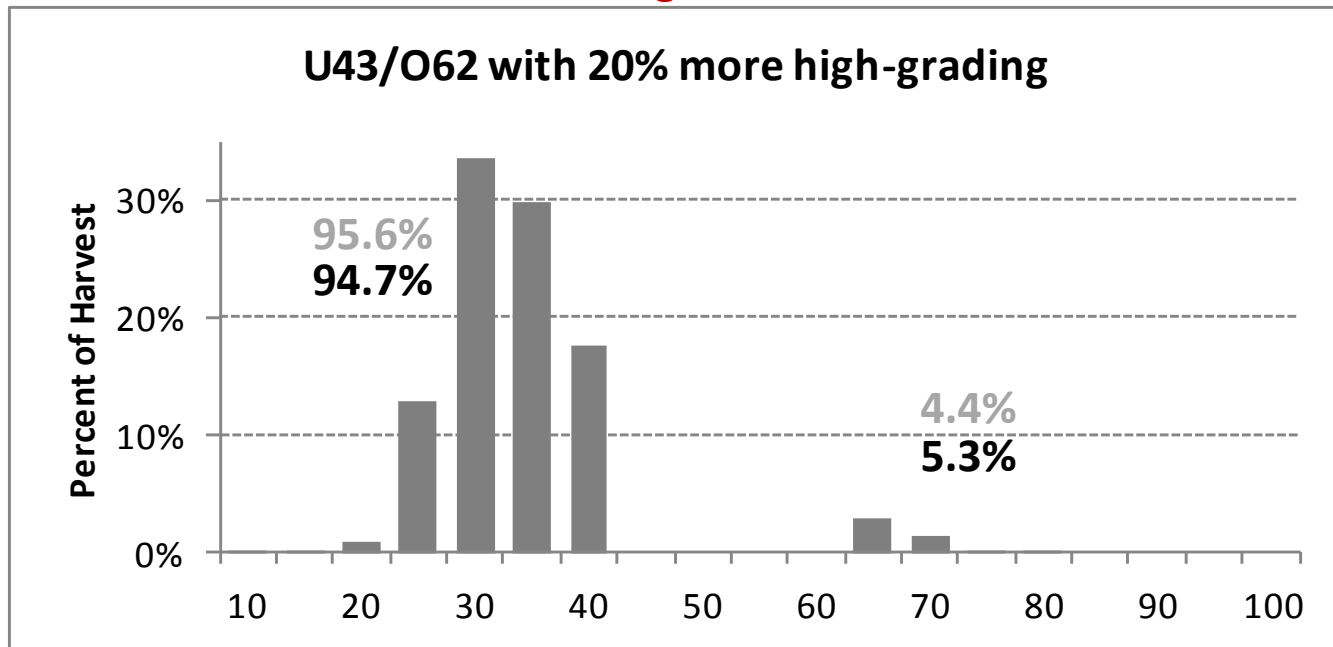
Reverse slot limit - 20% high-grading option



Reverse slot limit - 20% high-grading option

Overall average wt = 17.3 lb

Overall average wt = 18.2 lb



Reverse slot limit

Scenario – No high-grading

Harvest Level = 41,209

Upper (minimum) Size Limit (in)	Lower (maximum) Size Limit (in)										
	35	36	37	38	39	40	41	42	43	44	45
50	1.200	1.156	1.132	1.104	1.092	1.074	1.061	1.051	1.045	1.042	1.044
52	1.186	1.137	1.111	1.081	1.067	1.048	1.033	1.022	1.016	1.015	1.017
54	1.159	1.108	1.080	1.049	1.035	1.016	1.002	0.991	0.986	0.985	0.989
56	1.113	1.061	1.035	1.004	0.991	0.972	0.959	0.949	0.945	0.946	0.951
58	1.073	1.021	0.994	0.963	0.952	0.934	0.922	0.913	0.910	0.912	0.918
60	1.035	0.982	0.955	0.925	0.915	0.898	0.887	0.880	0.877	0.881	0.888
62	0.971	0.923	0.897	0.869	0.861	0.847	0.837	0.831	0.831	0.836	0.845
64	0.882	0.840	0.818	0.795	0.790	0.781	0.775	0.773	0.775	0.782	0.794
66	0.826	0.790	0.771	0.752	0.750	0.743	0.739	0.739	0.742	0.751	0.765
68	0.763	0.737	0.721	0.707	0.709	0.706	0.706	0.707	0.713	0.724	0.739
70	0.706	0.687	0.675	0.666	0.669	0.670	0.672	0.676	0.683	0.696	0.711
72	0.663	0.652	0.642	0.637	0.643	0.646	0.650	0.655	0.663	0.677	0.693
74	0.602	0.603	0.597	0.598	0.607	0.613	0.620	0.627	0.637	0.652	0.670
76	0.573	0.576	0.573	0.576	0.586	0.594	0.602	0.610	0.621	0.636	0.655

Reverse slot limit

- Potential Effects:
 - Allow retention of exceptionally large fish
 - Will require proof of size
 - Possible increase in handling/release mortality
 - Fish in closed slot must be released
 - Fish close to the limit need precise measurement

3. Day of the week closures

Harvest	Average Net Wt. (lb)	Yield (M lb)	Reduction Needed per GHL	
			0.788 M lb	0.931 M lb
41,209	25.8*	1.061*	26%*	12%*
45,338	26.2*	1.186*	34%	22%

* Revised from paper.

Day of the week closures

Table 5. Proportion of Area 2C charter halibut harvest by day of the week, 2008-2010 (ADF&G charter logbook data).

Year	Percent of the Number of Fish Harvested						
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
2008	14.7%	14.5%	15.4%	14.9%	13.8%	13.0%	13.8%
2009	14.4%	15.7%	15.5%	14.5%	14.7%	12.6%	12.6%
2010	15.3%	15.3%	14.2%	15.2%	15.1%	11.9%	13.1%
Average	14.8%	15.2%	15.1%	14.9%	14.5%	12.5%	13.1%

Day of the week closures

A. Reductions associated with combinations of two days.

	Mon	Tue	Wed	Thu	Fri	Sat
Mon	--	--	--	--	--	--
Tue	30%	--	--	--	--	--
Wed	30%	30%	--	--	--	--
Thu	30%	30%	30%	--	--	--
Fri	29%	30%	30%	29%	--	--
Sat	27%	28%	28%	27%	27%	--
Sun	28%	28%	28%	28%	28%	26%

Day of the week closures

B. Reductions associated with all possible combinations of 3 days (without consecutive days).

Closure	Harvest Reduction
Mon-Wed-Fri	44%
Mon-Wed-Sat	42%
Mon-Thu-Sat	42%
Tue-Thu-Sat	42%
Tue-Thu-Sun	43%
Tue-Fri-Sun	43%
Wed-Fri-Sun	43%

Day of the week closures

- Potential effects:
 - Easily understood.
 - Not expected to result in additional high-grading or release mortality.
 - Lack of size limit may encourage cleaning at sea, potential bias in estimation of average weight.
 - Enforcement - may be difficult to verify date of capture in some cases.
 - Projected effects of closures may be overestimated.

Summary

- Projected harvest = 41,209

Management Measure with 1-fish Bag Limit	GHL (M lb)	
	0.788	0.931
Maximum Size Limit	47 inches	55 inches
Reverse Slot Limit (no additional high-grading)	U35-36/O68 U37-39/O66 U40-44/O64 U45/O66	U35/O64 U36-37/O62 U38-40/O60 U41-45/O58
Reverse Slot Limit (20% additional high-grading)	U35-36/O70 U37-39/O68 U40-44/O66 U45/O68	U35/O66 U36-38/O64 U39-45/O62
Day of the Week Closure (no size limit)	Close 2 days	Close 1 day*

* Revised from paper.

Summary

- Projected harvest = 45,338

Management Measure with 1-fish Bag Limit	GHL (M lb)	
	0.788	0.931
Maximum Size Limit	44 inches	49 inches
Reverse Slot Limit (no additional high-grading)	U35-36/O72 U37-44/O70 U45/O72	U35/O68 U36-37/O66 U38-45/O64
Reverse Slot Limit (20% additional high-grading)	U35-36/O74 U37-43/O72 U44-45/O74	U35/O70 U36-37/O68 U38-41/O66 U42-43/O64 U44-45/O66
Day of the Week Closure (no size limit)	Close 3 days	Close 2 days

Sources of Uncertainty

- Assumed level of harvest in 2012.
- Target level of removals for charter anglers.
- Length data.
- Distribution of harvest among ports.
- No effect of regulation on number of fish harvested.
- How fish that replace catch in prohibited lengths are distributed.

Questions?

