

**NOAA
FISHERIES**

Deployment Performance Review of the 2015 North Pacific Groundfish and Halibut Observer Program

2015 Observer Science Committee

Presented by
Fishery Monitoring and Analysis Division, Alaska Fisheries Science Center, Seattle

North Pacific Fishery Management Council
Observer Advisory Committee
May, 2015
Seattle, WA

The Analytical Team

Analyses were performed by the Fisheries Monitoring and Analysis Division in consultation with experts with practical knowledge of observer data. The Division convenes its observer science committee annually. This years members included:

- Craig Faunce (AFSC/FMA)
- Jason Gasper (AKRO/SF)
- Jennifer Cahalan (PSMFC)
- Sandra Lowe (AFSC/REFM)
- Ray Webster (IPHC)
- Steve Barbeaux (AFSC/REFM)

This review is intended to inform the Council and the public of how well various aspects of the program are working and lead to recommendations for improvement (based on the data). OSC recommendations do not need to equate to official NMFS recommendations or actions for future ADPs.

Why so Random?

The observer program in Alaska is very large. However, the quantity of data provided must be useful.

To be useful, it must be unbiased.

To be unbiased, observers must collect information on all catch events, or must collect information on a subset of catch events.

To collect information on all catch events requires a lot of resources, and carries huge risk if not all catch is observed. On the other hand, sampling a subset of catch events is more efficient.

To be useful and unbiased, this sample data must be collected under randomization protocols. Random does not equal bad or haphazard.

For this reason, the observer program goes crazy trying to be random.

Changes in Methods:

- Trip counts and durations in this coverage category now reflect actual fishing trips rather than the unit of a week that is used in quota monitoring.
- geo-fencing algorithms were used to define trip durations for unobserved partial coverage trips that delivered to a tender vessel.
- A permutation test to examine whether observed trips were different from unobserved trips for all partial coverage activity (tendered and non-tendered trips combined) by stratum is now included.
- Permutation tests to examine whether partial coverage trips delivering to a tender are different from those that did not deliver to a tender were performed using 2015 and 2016 stratum definitions (i.e gear type; NMFS 2015a). In 2014 these tests were conducted on all partial coverage strata combined.
- Permutation tests to examine whether observed trips were different from unobserved trips within tendered and non-tendered trips are now conducted for each partial coverage stratum.

Observer Deployment 2015



Partial Coverage Two Year comparison: Overview

	2014	2015*
Total Funding (\$)	4,937,414	5,758,268
Total days funded	4,573	5,318
Cost Day (\$)*	1,080	1,083
Number of strata to evaluate	11	5
Effort prediction accuracy (ADP YEAR - 1 vs. Total days funded)	-7.4	-3.6

* Total funding divided by total days funded

Partial Coverage Two Year comparison: Observed Effort

	2014				2015			
	All	VS = t	TS = T	Zero	All	t	T	Zero
Total trips	8,789	2,079	4,390	2,320	8,825	2,148	4,676	2,093
Observed trips	986	324	662	0	1,335	241	1,094	2
Observed %	11.2	15.6	15.1	0.0	15.0	11.2	23.4	0.0

Partial Coverage Two Year comparison: ODDS

	2014	2015*	
	TS (T)	t	T
Total trips logged	4,383	2,147	4,368
Programmed Selection %	15.1	12.0	24.0
Actual Random # Selection Rate	15.5	11.6	23.8
Cancellation % (Selected Trips)	5.0	2.9	3.8
Cancellation % (Not-selected trips)	18.5	23.7	13.2
Selection rate as programmed?	Yes	Yes	Yes
Are initial and final selection rates similar over time?	No	No	No

* Does not include EM trips



Partial Coverage Two Year comparison: Temporal and Spatial Bias

	2014		2015	
	VS = t	TS = T	t	T
At-sea deployment rates as expected?	No	Yes	Yes	Yes
Dockside deployment rates as expected?	No	Yes	No	No
Temporal observation rates as expected?	NA	(15.8%)	(13%)	(0.6%)
Spatial observation rates as expected?	No	Yes	No	Maybe*

* Two, not one area was associated with a low p-value; patterns not consistent between years.

Partial Coverage Two Year comparison: Trip Metrics

	2014	2015	
	VS (t) + TS (T)	t	T
Observed trips same as unobserved?	NA	No* 8-14% shorter trips when observed 1% less diverse	
Tendered trips same as non-tendered?	No	No	

* Although the number of low p-values was equal to expected, the same metric was found in both strata; Since catch metrics are the same, is this evidence of differential behavior?

Partial Coverage Two Year comparison: Trip Metrics

	2014		2015	
	VS (t) + TS (T)		t	T
Observed trips same as unobserved? (tendered trips only)	No		Maybe	
	9% shorter trips with 6% less pure catch when observed		33–101% less catch when observed ¹	
			25% fewer species	51% shorter trips
Observed trips same as unobserved? (non-tendered trips only)	VS (t)	TS (T)	t	T
	No ²	No ³	No ⁴	
		2.5% shorter vessels	5-13% shorter trips when observed	
		9% Less catch	3.4% fewer areas	1.2% less diverse

1 Although this result was not associated with a p-value of < 0.05, large effect sizes were found..

2 expected two low p-value tests, had 18.

3 No comment on this result, when evaluated by gear, Hook and Line and Trawl gear different.

4 Although the number of low p-values was equal to expected, the same metric was found in both strata;

Since catch metrics are the same, is this evidence of differential behavior?

Adequacy of sample size:

The observer at sea is providing NMFS with at-sea discard rates on catcher vessels that are applied to landed catch to produce total catch. The goal is to apply discard rates from observed trips to unobserved trips with similar traits (you wouldn't want to apply discard from a BSAI trawler to a GOA trawler for example).

For this reason, it is important that for each NMFS Area there is at the very least one observed trip. We can evaluate the likelihood of “missing” an area from 2015 data.

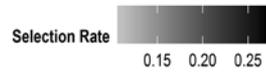
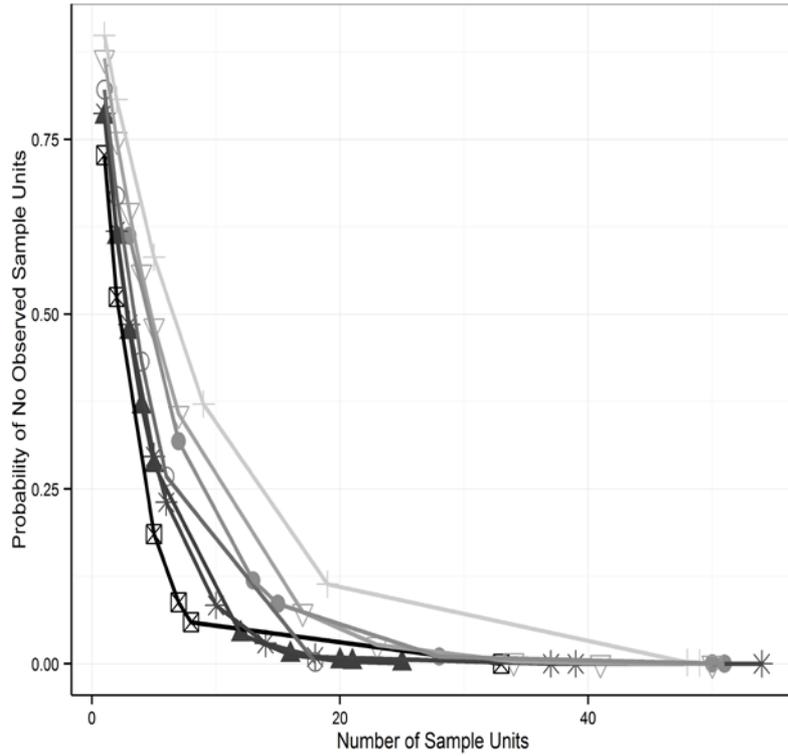
The likelihood of missing goes down as you:

- Increase the number of trips in an area
- Increase the sampling rate

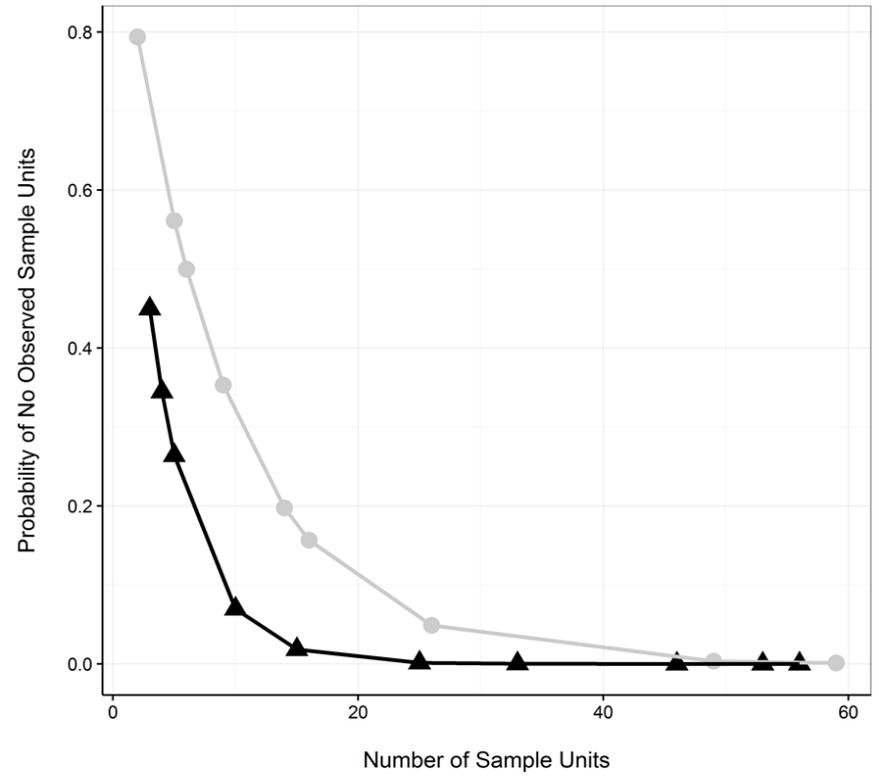
Areas and gears with low amounts of effort activity will require higher selection rates to observe than areas and gears with large amounts of effort.

Small deployment “boxes” require higher rates of selection.

2014



2015



OSC Recommendations





OSC Recommendations 2014

The use of metrics known before a trip begins is necessary for the designation of deployment strata. Each trip must be assigned to one and only one deployment strata at the time it is logged. **The merits of deploying observers by gear and FMP should be explored in future ADPs.** There are FMPs and gear types for example that have low effort and are highly likely to be missed in random selection procedures without high selection rates



OSC Recommendations 2014

The assumption used in the ADP that effort in the following year will be equal to that two years prior should be improved upon. The NMFS should develop better tools such as models to predict fishing effort.



OSC Recommendations 2014

The practice of granting releases whereby vessels are sometimes subject to human observer coverage and sometimes not subject to human observer coverage should be discontinued. We recommend that a list of vessels that cannot carry an observer be generated. The list should be updated each calendar year. This list defines a new strata to be observed with alternatives to human monitoring, and should be included in the annual deployment plan and annual review.



OSC Recommendations 2014

We repeat our 2013 recommendation that the linkage between ODDS and eLandings be strengthened through the use of a trip identifier.

Multi-year Issues **ODDS**

2014:

Change current protocols of allowing selected trips to be cancelled and multiple trips to be logged in ODDS to reduce the potential for delay in observer coverage and temporal bias

NMFS did not explore changes to the cancellation policy. The Council did not support NMFS suggestions that the number of trips able to be logged in ODDS be reduced from 3 to 2.

2015:

OSC recommends that NMFS work with its partial coverage contractor and the OAC to explore the possibility of eliminating the ability to cancel an ODDS trip since the ability to change dates is facilitated in ODDS.

Multi-year Issues **Tendering**

2014:

No formal OSC recommendation.

- Tender trip definition means that all or none of a vessels activities can be observed.
 - Vessels that tender not covered by safety requirements of MSA,
 - Catch delivered to a tender is not accessible to the observer,
- Tender vessel mixes catch from multiple deliveries, confounding dockside monitoring efforts since unknown what vessel caught what salmon where.
- Inter-annual GOA Chinook stock compositions have been remarkably stable since 2010.
- Alternatives to Federal Observer program includes citizen or other third party
- Additional dockside monitoring with additional funds- observers at-sea catch sampling primary deployment objectives.

Multi-year Issues **Tendering**

2015:

- trends in the use of tendering by the fleet over time in Council discussion papers does not equate to a change in observer bias. The Annual Reports examine for observer effects.
 - Tendered trips are not the same as non-tendered trips.
- Within tendering trips, there was a wide difference in the weight of retained catch. However, the variance of this metric is also large, making conclusions about this effect more difficult. There was only one metric with low p-values in each stratum, and this was expected under the hypothesis that observed and unobserved tendered trips were the same.

The OSC recommends that Tendered trips should be evaluated as separate strata in future ADPs.

- There is no way to identify the duration of an unobserved tendered trip without VMS on-board.
 - OSC supports the implementation of tlandings.

Multi-year Issues **Partial CPs**

2014:

An expansion of the partial coverage [CP] class would necessitate their treatment as a separate stratum with a potentially different selection rate in ODDS

In 2016 the partial CP class was expanded.

2015:

The OSC reiterates our 2014 recommendation that the expansion of the pool of partial coverage catcher processors warrants their treatment as a separate strata in future ADPs.

Multi-year Issues **Sampling Rates**

2014 & 2015:

The OSC recommends that sampling rates in future ADPs be high enough to maximize the probability of achieving three observed trips in each NMFS Area.

- Gaps in coverage severely minimized at deployment rates $> 15\%$ in simulation studies (SEA);
- Spatial bias in *t* stratum at 11.2 – 15% coverage, but not in *T* stratum with increase from 15 to 24% coverage (2014 to 2015);
- Elimination of temporal bias in *T* stratum from 15 to 24% coverage



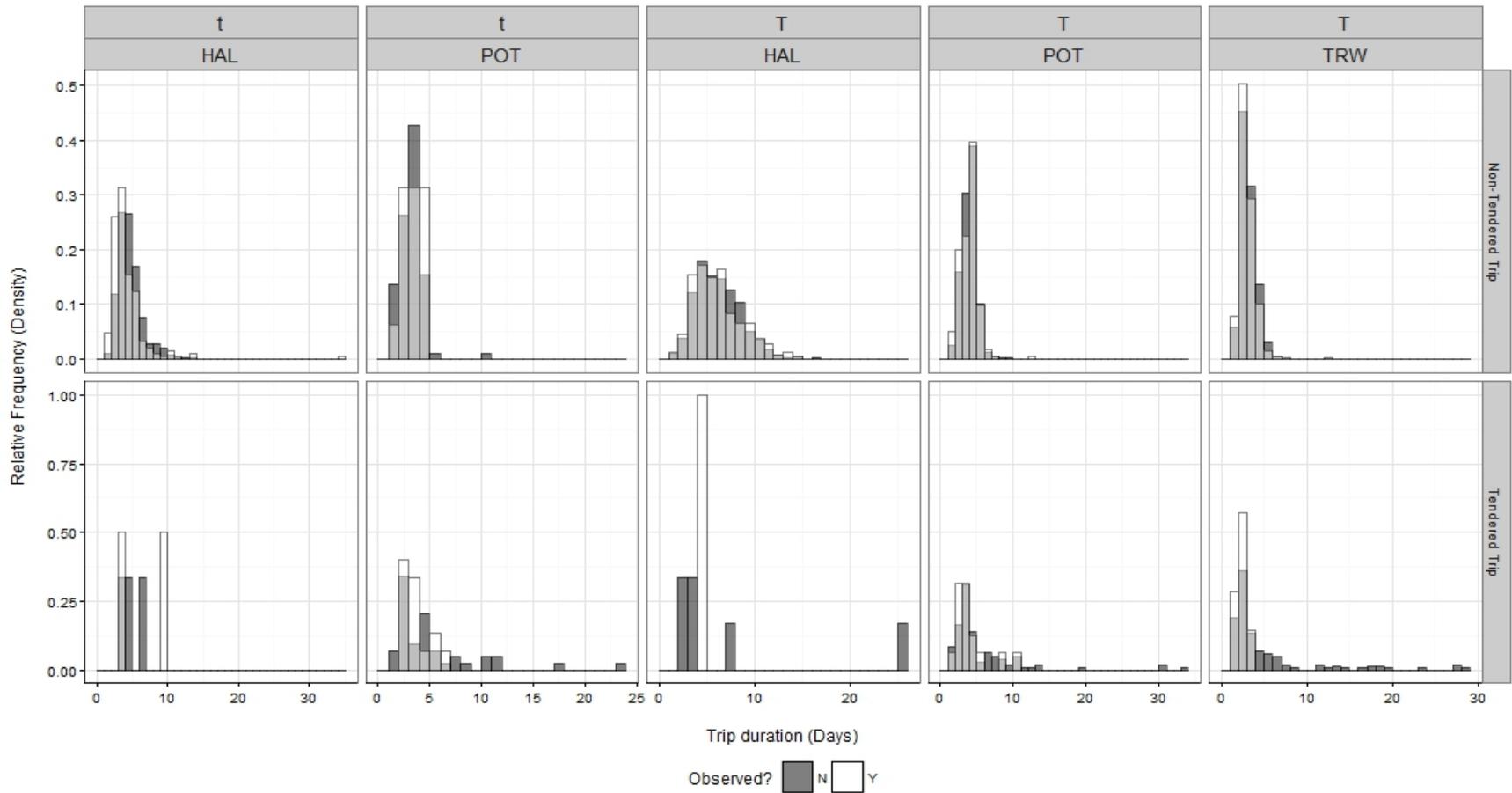
See More At: <https://alaskafisheries.noaa.gov/fisheries/observer-program>



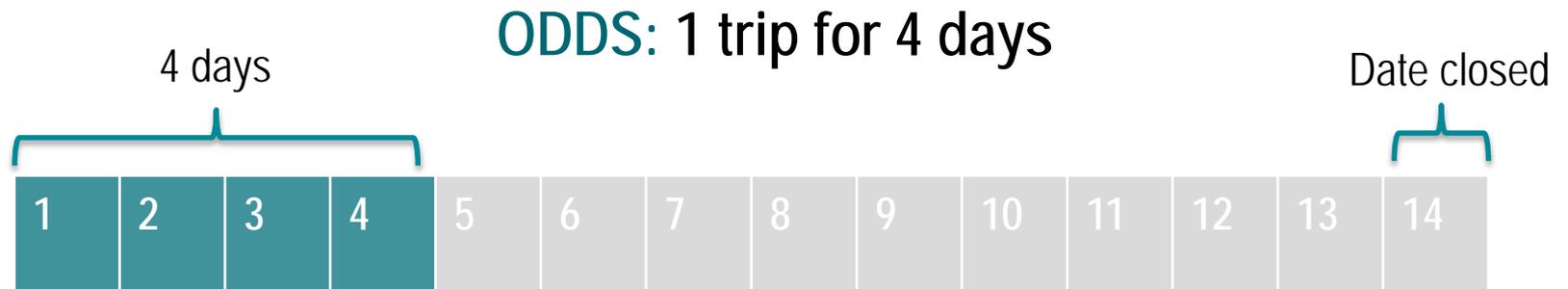
How long is this trip going to take?



How long is an unobserved tendered trip?

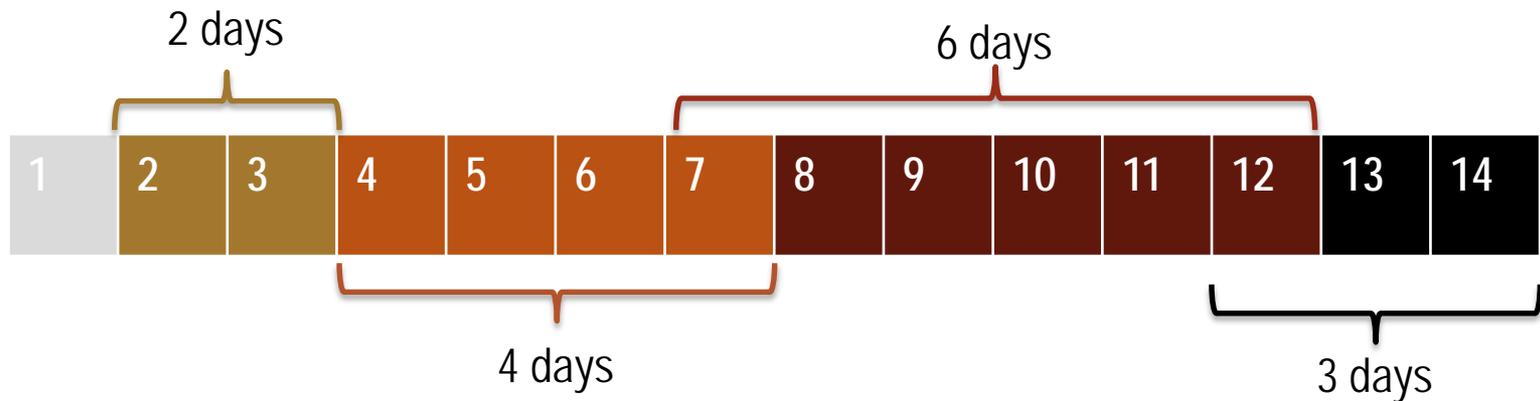


Sure? How long is *this* tendered trip?



VMS + Landings: 4 trips for 15 days

*returns to port with FPP each time



Annual Report: without VMS, if same tender: 1 trip for 14 days

