North Pacific Observer Program
Draft Annual Deployment Plan
2017

Presented by
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Alaska Fisheries Science Center, Seattle

Annual Deployment Plan Schedule

- June 2016 Council Meeting -- Annual Report review of 2015
- Sept 2016 OAC Meeting – Draft 2017 Annual Deployment Plan
- October 2016 Council Meeting – Draft 2017 Annual Deployment Plan
- December 2016 Council Meeting – Final 2017 Annual Deployment Plan

Design:

"Where and how many observed trips will be conducted
given available budgets and anticipated effort"

Composed of stratification schemes and allocation strategies.

2016 ADP: 12 **competing** designs

6 stratifications schemes

2 allocation strategies

2017 ADP: 12 **alternative** designs

4 stratification schemes

3 allocation strategies

Stratification:

"How you divide the fleet based on qualities known before a trip begins"

Focus for 2017 is on alternates to the best performing design from the 2016 ADP

1. Gear (3 strata)	Status quo
2. Gear + Partial Hook and Line CPs (4 strata)	Addresses potential diffs between CPs and CVs
3. Gear x Tender (6 strata)	Addresses "tendering issue"
4. Gear x Tender + Partial Hook and Line CPs (7 strata)	Addresses all of the above

Allocation:

"where to put those samples you bought"

A. You can set all rates = (proportional allocation) 2016 ADP

B. You can allocate to reduce overall variance scaled to effort (optimization) 2017 ADP

C. You can do B. but for multiple metrics, or selected for 2016 ADP

D. You can select along a large range of possibilities by what feels good, sounds good, is popular, etc.

Optimization:

"greatest bang for the buck"

Optimization routines in the 2017 ADP were based on minimizing the product of the variance given effort in a stratum (Neyman allocation)

These routines have been improved in the 2017 ADP to choose the sample size in each stratum that minimizes variance for a specified total budget. Cost per stratum and total budgets are now explicitly included in the optimization algorithm.

Council motions support optimization

October 2012

Recommend that NMFS insert cost effectiveness measures into the deployment plan, to prevent expensive deployments to remote areas for insignificant amounts of catch.

June 2014

Begin to address the question of how and when the program transitions to optimization of observer days according to particular fishery data and management needs.

June 2015

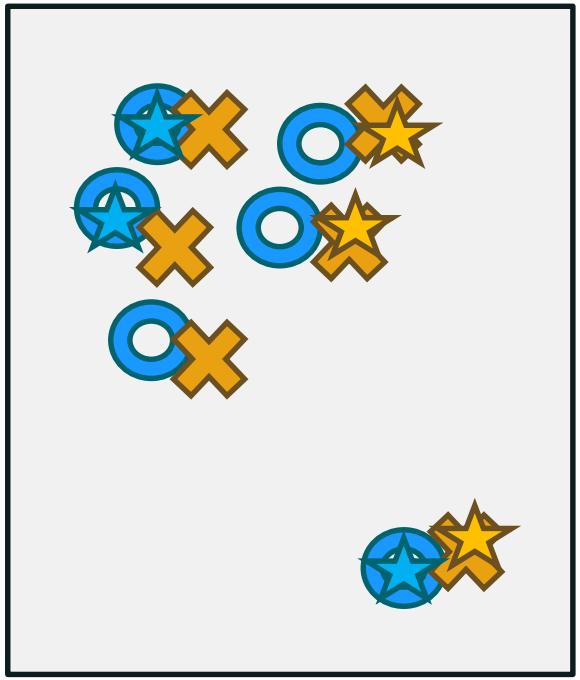
Assess inefficiencies in the program and evaluate ways to achieve cost efficiencies in the partial coverage category within the existing 5-year contract.

June 2016

The Council recommended maintaining 3 sampling strata defined by gear in 2017, and continue to use optimal allocation to evaluate deployment rates.

Optimization in practice:

*n*obs = 6



No = Nx = 6

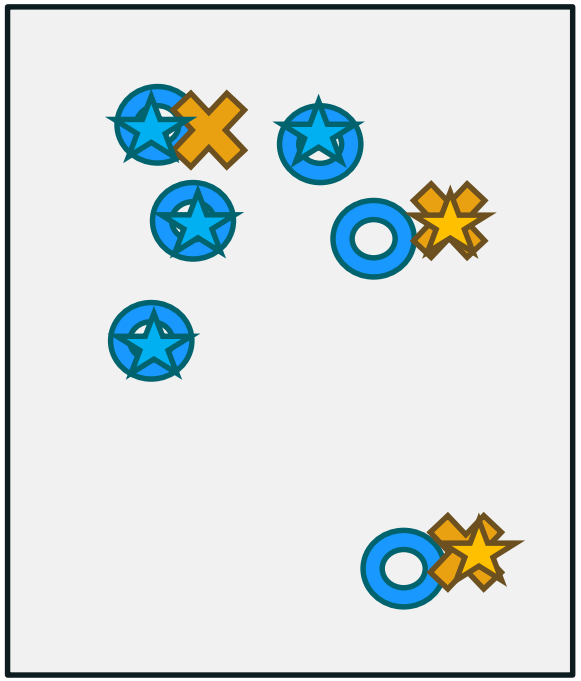
Vo = Vx

$o = $x

Wo = 0.5; *n*o = 0.5 * 6 = 3; ro = 3 / 6 = 0.5

Wx = 0.5; *n*x = 0.5 * 6 = 3; rx = 3 / 6 = 0.5

Put equal observer coverage in each stratum



No >> Nx

Vo = Vx

$o = $x

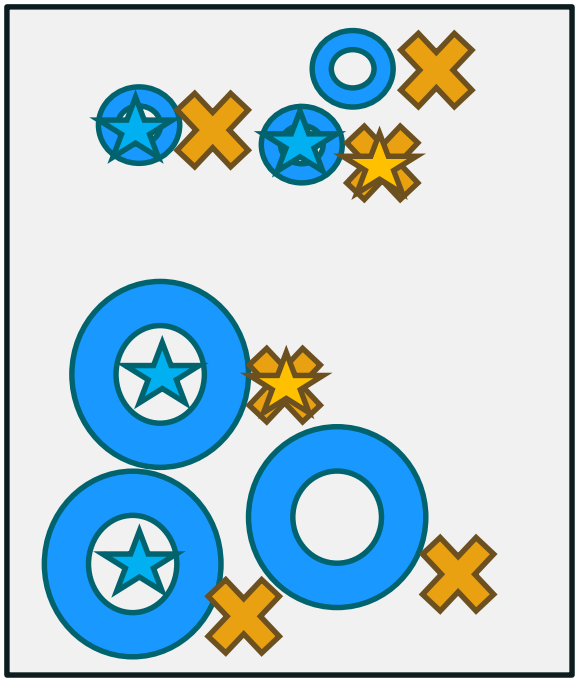
Wo = 0.67; no = 0.67 * 6 = 4

Ro = 4 / 6 = 0.67

Wx = 0.33; nx = 0.33 * 6 = 2

Rx = 2 / 3 = 0.67

Put more observer effort where there is more fishing effort



No = Nx

Vo >> Vx

$o = $x

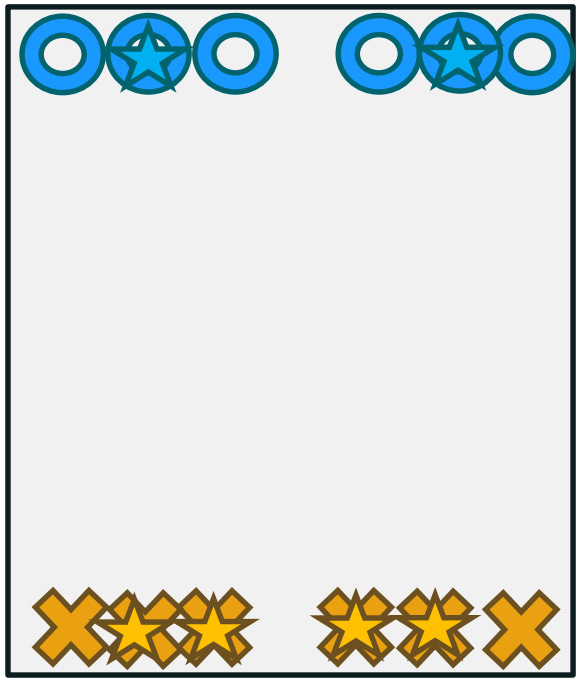
Wo = 0.67; no = 0.67 * 6 = 4

Ro = 4 / 6 = 0.67

Wx = 0.33; no = 0.33 * 6 = 2

Rx = 2 / 6 = 0.33

Put more observer effort where there is more variance



No = Nx

Vo = Vx

$o >> $x

Wo = 0.41; no = 0.41 * 6 = 2

Ro = 2 / 6 = 0.33

Wx = 0.59; nx = 0.59 * 6 = 4

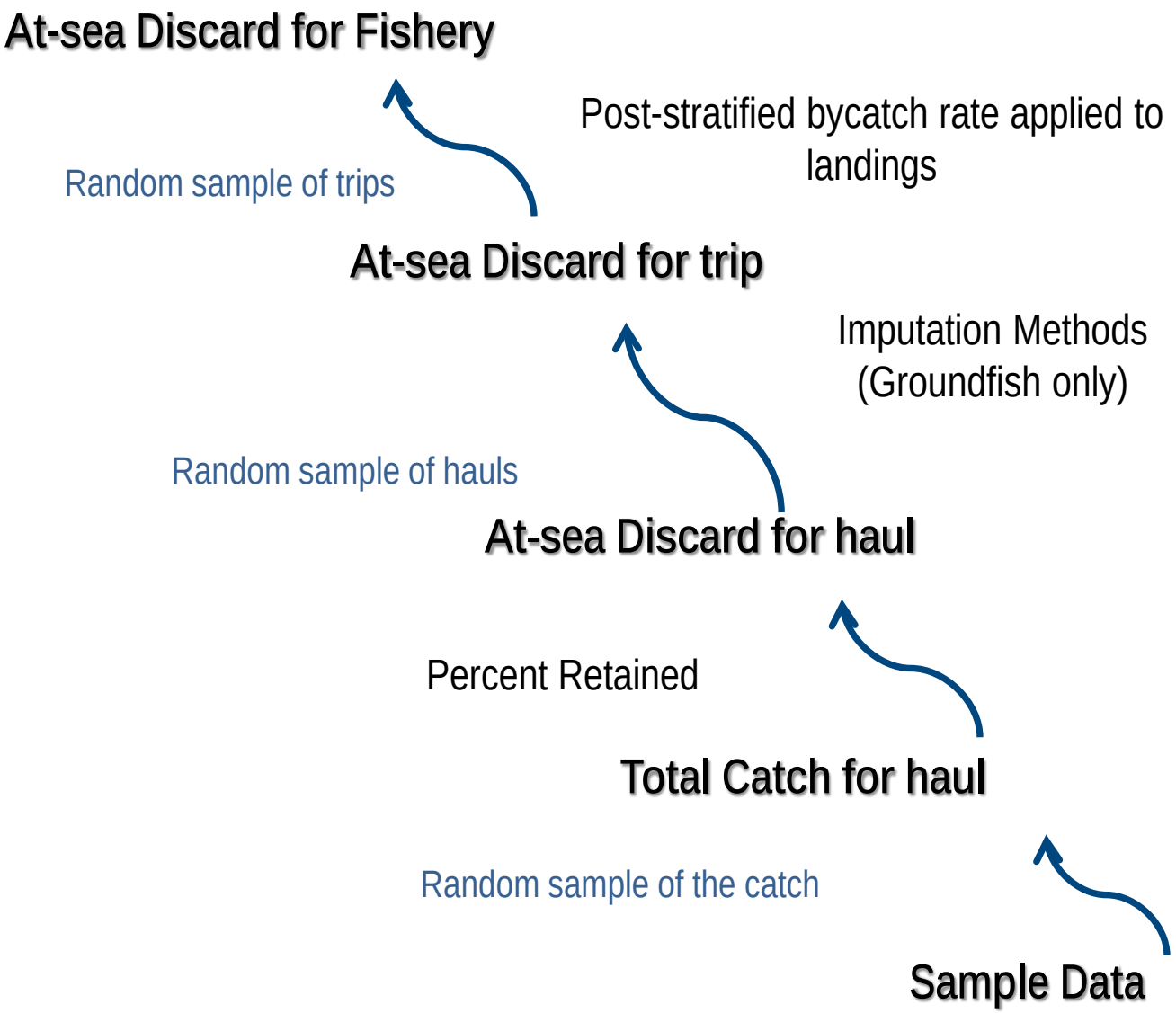
Rx = 4 / 6 = 0.67

Put more observer effort where it is cheaper

Why minimize variance of discards?

Data collection by observers is currently the only reliable and verifiable method available for NMFS to gain fishery **discard** and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries.

Much of this information is expeditiously available (e.g., daily or at the end of a trip, depending on the type of vessel) to ensure effective management


At-sea Discard for Fishery
Post-stratified bycatch rate applied to landings
Random sample of trips
At-sea Discard for trip
Imputation Methods (Groundfish only)
Random sample of hauls
At-sea Discard for haul
Percent Retained
Total Catch for haul
Random sample of the catch
Sample Data

2017 Draft ADP

Goal

Build a financially stable observer program
Stable sample size
January 2017-2019

Assumptions

List of Voluntary EM vessels
Voluntary 100% BSAI vessels
No Federal funding
1.25% fee totaling $3.9M

Council supported recommendations from the 2015 Deployment Performance Review

- Use trip-selection to assign observers to vessels in 2017.

- evaluate two additional strata for the 2017 ADP.
    1) Vessels delivering to tenders
    2) Partial coverage catcher-processors

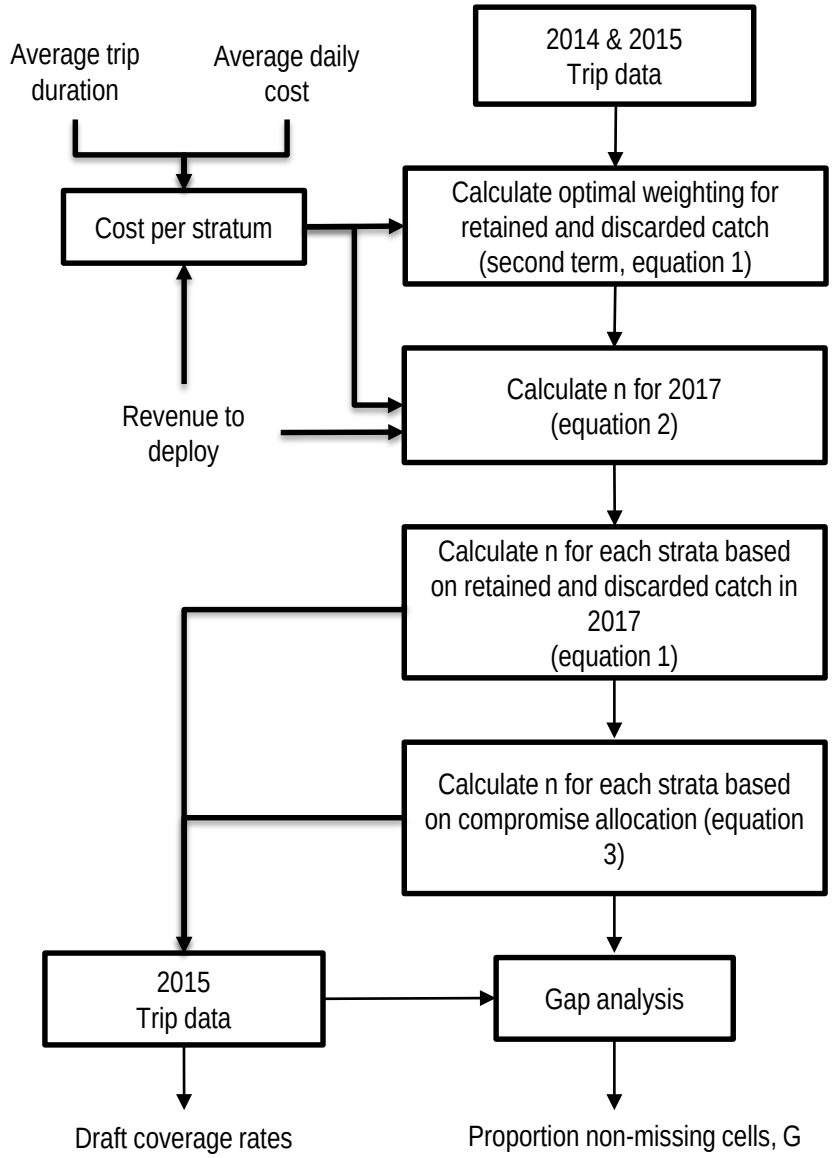
12 Alternative designs

Four stratification schemes:

1. Gear (status quo) – 3 strata
2. Gear + partial coverage catcher-processors – 4 strata
3. Gear x Tender – 6 strata
4. Gear x Tender + partial coverage catcher-processors – 7 strata

Three allocation strategies were analyzed:

1. Retained
2. Discarded
3. Compromise (retained + discarded)



$$where\ W_{hopt} = \frac{N_h S_h / \sqrt{c_h}}{\sum_{h=1}^{H} \left(N_h S_h / \sqrt{c_h} \right)}$$

$$n = \frac{(C - C_T) \sum_{h=1}^{H} \left(N_h S_h / \sqrt{c_h} \right)}{\sum_{h=1}^{H} \left(N_h S_h \sqrt{c_h} \right)}$$

$$n_h = n * W_{hopt}$$

$$m_h = \bar{n}_{h\ opt,} \text{ where } \bar{n}_h = \frac{\sum_{l=1}^{L} n_{lh}}{L}$$

$$r_h = n_h / N_h$$

Drop in total sample size (*n* = observed days)

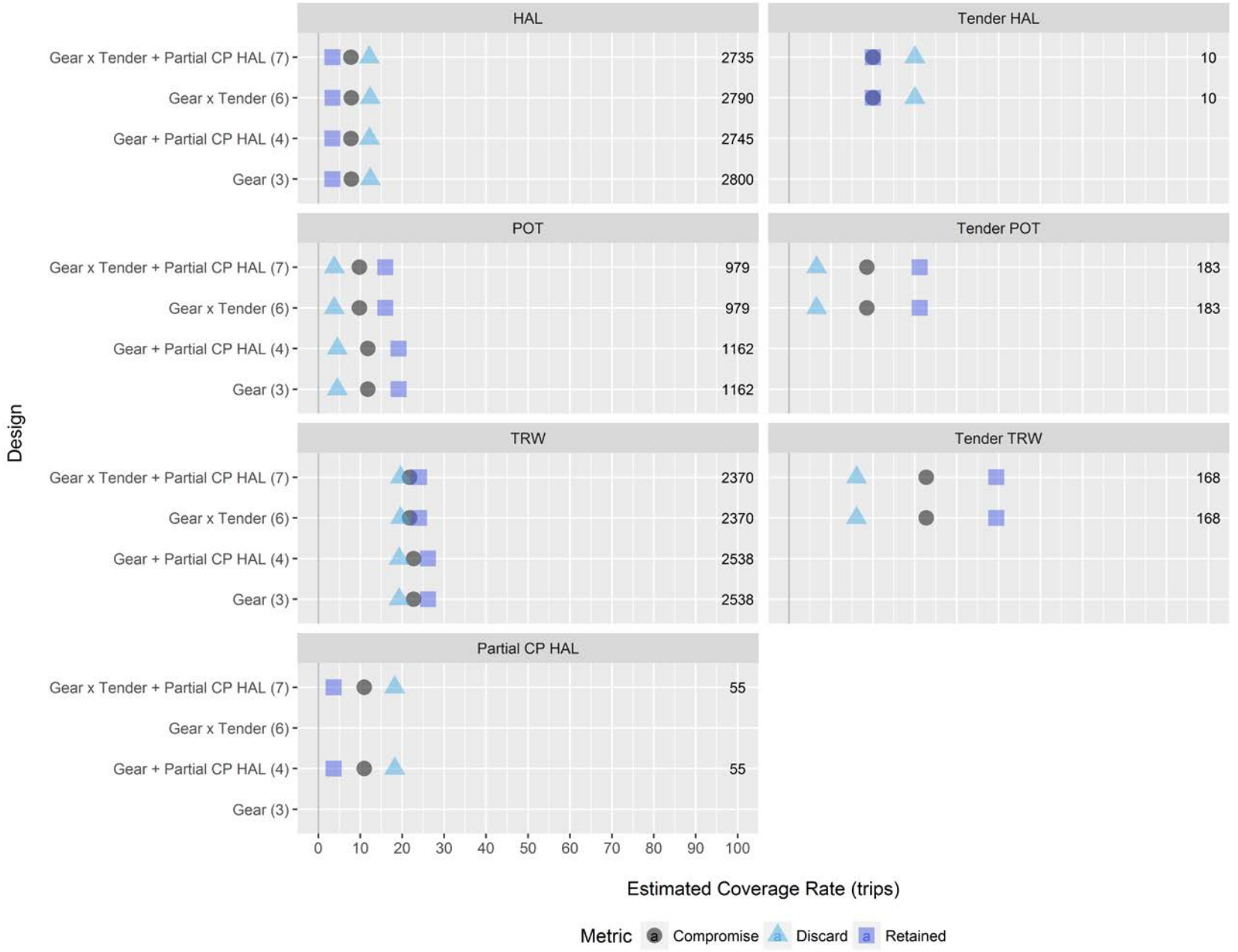
2013: 3,533

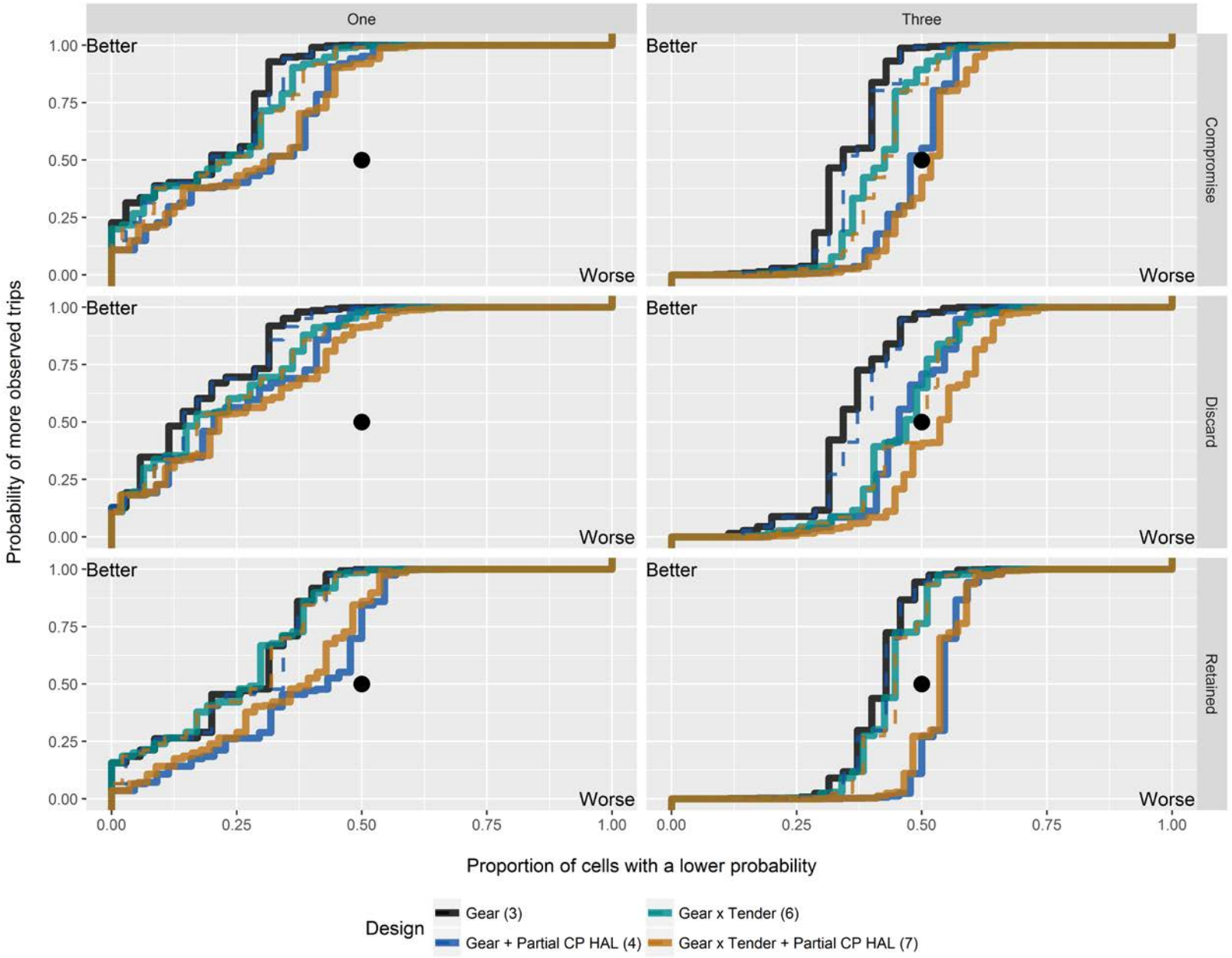
2014: 4,573

2015: 5,318

2016: 4,900 (estimated 2016 ADP)

2017: 3,505 (30.7 % below the 2013-2016 average of 4,581)


HAL
Tender HAL
POT
Tender POT
TRW
Tender TRW
Partial CP HAL
Gear x Tender + Partial CP HAL (7)
Gear x Tender (6)
Gear + Partial CP HAL (4)
Gear (3)
2735
2790
2745
2800
10
10
979
979
1162
1162
183
183
2370
2370
2538
2538
168
168
55
55
Design
0
10
20
30
40
50
60
70
80
90
100
Estimated Coverage Rate (trips)
Metric
Compromise
Discard
Retained


One
Three
Compromise
Discard
Retained
Better
Worse
1.00
0.75
0.50
0.25
0.00
Probability of more observed trips
Proportion of cells with a lower probability
Design
Gear (3)
Gear + Partial CP HAL (4)
Gear x Tender (6)
Gear x Tender + Partial CP HAL (7)

NMFS Recommendation

Gear x Tender (6) stratification scheme with discard optimal allocation

Preliminary deployment rates for 2017 (number of trips) [selection rate in 2016]:

Hook & Line **11.1** (2790) [15%]

Pot **3.4** (979) [15%]

Trawl **17.6** (2370) [28%]

Hook and Line Tender **27** (10)

Pot Tender **5.9** (183)

Trawl Tender **14.5** (168)

Observer Program is employing optimized allocation while balancing its ability to fill gaps for in-season management of quotas and focusing on core role of at-sea deployment (discards).

NMFS ADP Policies

Conditional Release

For 2017 NMFS recommends continuing conditional release policies in place during 2016 and will not issue conditional releases or temporary exemptions to any vessels subject to observer coverage.

No selection pool

The “no selection” pool is comprised of vessels that will have no probability of carrying an observer on any trips for the 2017 fishing season. These vessels are broken into two categories:

- Catcher vessels less than 40 ft LOA, or vessels fishing with jig gear, which includes handline, jig, troll, and dinglebar troll gear.

- *EM Selection pool*: Fixed gear vessels that have opted-in and will participate in the 2017 EM cooperative research described in the EM Pre-Implementation plan.

Observer Declare and Deploy System

No changes from 2016

- 3 trips can be logged into ODDS
- Observed trips that are cancelled will automatically be selected for observer coverage on the next logged trip
- ODDS programming prevents small vessels from being selected for a third consecutive trip.

Next Steps (Final ADP)

With Final EM and Voluntary 100% BSAI vessel lists:

Adjust anticipated fishing effort if warranted given trends seen in fishery Jan-Oct of each year (*incl. 2016*)

Simulate sampling of '2017' fishery given optimal weightings for each stratum from this draft ADP,

Present results as 2017 Final ADP in December and program resulting selection rates into ODDS.

A Proposal

Move ADP from an every year process to a “on year- off year” schedule.

Every other year NMFS will evaluate potential deployment designs including stratification schemes, allocation strategies, and resulting deployment rates that will be reviewed by the Council’s Plan Teams, Observer Advisory Committee, Advisory Panel, and Council (the “on-year” process).

The following year, only adjustments to the rates will be evaluated by NMFS and reported to the Council (the “off-year” process).

Contact Information

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ADPs and Reports online at:
https://alaskafisheries.noaa.gov/fisheries/observer-program-reports